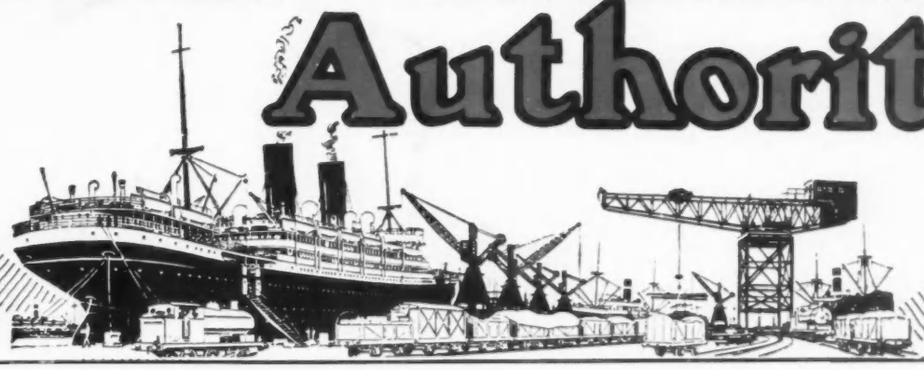
The Dock & Harbour Authority



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Contributions which are to be paid for must be clearly marked thus; otherwise they will be considered gratuitous.

If intended for publication in the current month they must come to hand not later than the 20th of the preceding month.

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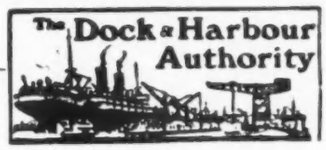

CONTENTS.

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THE DOCK & HARBOUR AUTHORITY

No. 184. Vol. XVI. FEBRUARY, 1936

It is with the deepest regret that we record the death of His Majesty King George V., who passed away at Sandringham on January 20th, 1936, and we extend our sincere and heartfelt sympathy to King Edward VIII., Queen Mary and the other members of the Royal Family in their great loss.

During the 25 years in which King George V. reigned, many projects were undertaken in the docks and harbours of the British Isles, but the largest and most recent development undertaken was the construction of the King George V. Graving Dock at Southampton, which was officially opened by His Majesty King George V. on July 26th, 1933. This graving dock, which bears the name of our late King, will always stand as a memorial to him.

Editorial

Port of Southampton's Good Year.

It is now possible to give the complete official figures for traffic at Southampton Docks in 1935, and, as forecast last month, they show that the year was extremely successful from every point of view.

Compared with 1934 gross tonnage inward showed an increase of 7.8 per cent. and net tonnage inward an increase of 11.8 per cent. There was an increase of 12.9 per cent. in cargo and an increase of 11 per cent. in the number of passengers.

Inward gross tonnage in 1935 amounted to 17,991,539 tons, as compared with 16,682,501 tons in the previous year, an increase of 1,309,038 tons. The net total was 9,738,323 tons, as against 8,709,736 tons in 1934, an advance of 1,028,587 tons.

The cargo handled during the year amounted to 1,048,400 tons, compared with 929,012 tons in 1934, an increase of 119,388 tons. The advance under this heading is particularly gratifying, for the Southern Railway Company have long cherished an ambition to make Southampton one of the big cargo ports of the country. The new docks have furnished extra facilities, and there is no doubt that the increase which has taken place is partly due to the extra accommodation which is now available for shipping.

Southampton well maintained her position as the premier passenger port of the United Kingdom. The number of passengers passing through the docks during the year was 537,455, compared with 484,174 in 1934, an increase of 53,281.

Further Newcastle Quay Extension.

At the December meeting of the Tyne Improvement Commission approval was granted to plans from the Newcastle Corporation, showing a further length of quay extension east of the Guseburn. The proposed quay is to extend from the eastern end of the existing quay, a distance of about 630 feet. The quay is proposed to be constructed of reinforced concrete in bays at 18-ft. centres, the superstructure being carried on piles driven to depths varying from 48½ ft. to 35 ft. below L.W.O.S.T. At the front of the quay groups of six 16-in. by 16-in. octagonal piles 56 ft. long are to be driven, each group being enclosed in a concrete cylinder 9 ft. diameter set at a level 31 ft. below L.W.O.S.T. and built up to deck level. At the middle of the quay groups of piles are to carry concrete columns, and the back of the quay is to be formed of a concrete slab 20 ft. wide, and a retaining wall carried on a further group of piles, the slab being about 6½ ft. above L.W.O.S.T., and the retaining wall extending up to deck level. Upper and lower cross beams are to extend between the cylinders and the centre columns and between the latter and the retaining wall, the upper beams being to carry the deck and the longitudinal beams on which crane and gantry rails and two railway tracks are to be laid. The deck is to be 52 ft. wide, and 6 ft. 9 in. above H.W.O.S.T., the front of the quay being fitted with timber fenders. Steel sheet piles, 38 ft. long, are to be driven at the back of the quay along its whole length, and the piling is to be continued for a length of 60 ft. beyond the east end with a return length of 43 ft. parallel to the east end of the quay, the 60-ft. extension being secured with tie rods and anchor blocks. The bed of the river along the front of the quay is to be dredged to a depth of 30 ft. at L.W.O.S.T., and under the quay there is to be a slope of 2½ to 1.

Position of Sligo Port.

On being re-elected Chairman of Sligo Harbour Commissioners, Mr. A. P. Jackson said that their import and export figures for the past eleven months showed the detrimental effect which the economic war with Great Britain, in conjunction with the changing industrial conditions of the Free State was having on the trade of the port. The decrease in imports of maize meant a loss of revenue of over £1,000, and the decrease in sugar a loss of over £600. The large decrease in exports of sheep was accounted for by the fact that during the lamb season a bounty of 16s. per cwt. was paid on dead lambs.

From 1st January to 30th November the total revenue from shipping was £10,052, a decrease of £777; harbour dues £3,584, decrease £399; export dues £997, decrease £83; total vessels arriving 213, decrease 9; coal cargoes from British ports 58, increase 14.

Reports were submitted, he said, dealing with the reconstruction in concrete of wooden jetties at the deep-water berths to facilitate timber cargoes. The question of carrying out improvements to the harbour, as recommended by Sir Alexander Gibb and Partners, London, is under consideration.

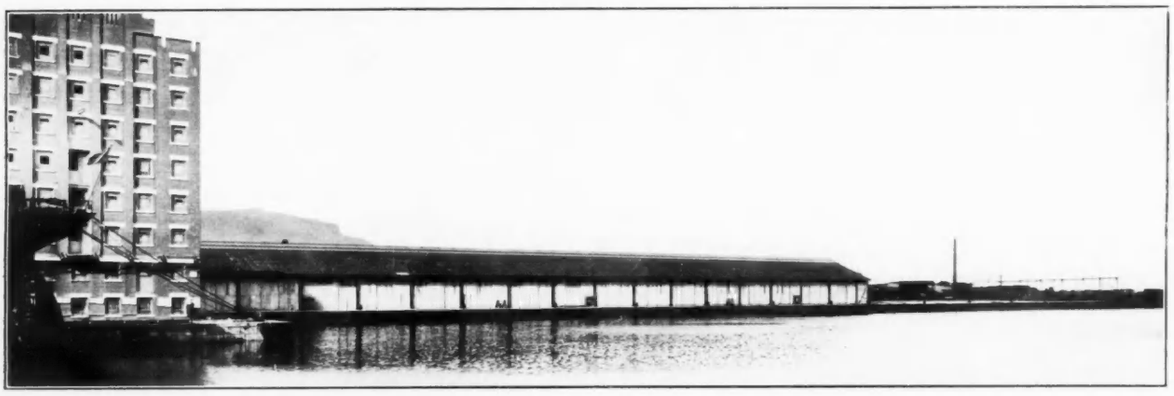
Last January the Board paid off £18,000 of the £56,000 4 per cent. Debenture issue, which effected a saving of £1,956 a year.

Knighthood for Dock Manager.

At the January meeting of the Mersey Docks and Harbour Board, members offered congratulations to Mr. L. A. P. Warrer, general manager, upon the honour of knighthood conferred upon him. Sir Richard D. Holt (chairman) said the distinction was thoroughly deserved. Mr. Warner had done a great deal of very good work for the Board, and also public service in other directions, including assistance to various Government departments. Mr. Warner, in acknowledgment, said the distinction he had received was not only a personal gratification for him, but it was good for the port and for the staff of the Board.

Mr. Lionel Ashton Piers Warner, C.B.E., Secretary and General Manager of the Mersey Docks and Harbour Board, has been engaged in transport since he was 18 years of age. He entered the service of the Great Western Railway Company at Abergavenny, and later was appointed to the head office in London of the L.N.W.R. At the close of 1910 he came to Liverpool as goods superintendent. His connection with the Dock Board began in 1914, when he became joint assistant to Mr. Alfred Chandler, the general manager. On the retirement of Mr. Chandler, Mr. Warner became his successor. In 1917 he joined the Ministry of Shipping as Director of Ports Branch, and later still he was made a member of the Port and Transit Executive Committee.

The Use of Timber in Marine Works



Pollard Dock and Basin, Belfast Harbour.

THE strength and resilience of timber make it from many points of view ideal for marine construction, but its great disadvantage has been lack of durability. Improved methods of timber preservation in recent years, however, have put the timber marine structure in the permanent class. Properly treated timber will outlast the useful life of the structure in which it is used.

For timbers such as Douglas fir and pitch pine which, because of their elasticity and the large sizes in which they are obtainable are best suited to marine work, creosote treatment is the most satisfactory method of preservation. The life of a properly-creosoted timber structure in this country will be at least 25 years, and if the structure is not neglected its life may be prolonged indefinitely. Other woods generally employed, such as jarrah, karri, greenheart and turpentine, will not absorb preservative to any extent, and will not give the service of properly-creosoted Douglas fir or pitch pine.

There are many methods of creosoting, but the only one which gives a sufficiently heavy impregnation and penetration in Douglas fir and pitch pine is the boiling-under-vacuum process. By employing proper creosoting methods there is no difficulty in impregnating Douglas fir with up to 20 lbs. of creosote per cubic foot, nor in obtaining a uniform penetration of $\frac{3}{4}$ inch. Its reputation as a difficult timber to creosote is largely due to the use of unseasoned or only partially seasoned timber; to the necessity for incising it before treatment; to the fact that insufficient temperatures and pressures are employed; and to the fact that sufficient time in the creosoting cylinder is not allowed.

A Full Cell treatment of 12 to 14 lbs. of creosote per cubic foot of timber will permanently preserve the wood from marine borer attack, unless collision or some other extraneous cause exposes untreated wood. The uniform penetration of $\frac{3}{4}$ inch effected by this impregnation is sufficient to protect the timber beyond the depth of any ordinary abrasion, which cannot be said of treatments giving only $\frac{1}{4}$ inch or $\frac{1}{2}$ inch penetration. For timbers to be used above high-water level or in fresh water, an 8-lb. Empty Cell treatment is sufficient, and will give similar penetration. In the Empty Cell treatment, however, the creosote oil is not concentrated, as in the Full Cell Process, as all free oil is expelled from the wood.

A recent report on the Lake Pontchartrain trestle in Louisana, U.S.A., on the main line of the Southern Railway, from Washington to New Orleans, shows that structure a pre-eminent example of the serviceability of creosoted timber. Built in 1883, this six-mile structure has been in constant service for fifty-two years, in subtropical climatic conditions, where the annual rainfall is more than 56 inches. It was built long before any degree of perfection had been attained in the preservative treatment of wood, and before the permanent preservative effect of creosote had had an opportunity of proving itself. In fact, so little was known of the treatment employed, that the specification merely stated that "the oil used shall be so-called creosote oil, from London, England, and shall be of heavy quality."

But not only is the Lake Pontchartrain trestle an outstanding example of the service to be expected from timber structures, it is also an outstanding example of the ease with which they may be adapted to meet changing conditions. The trestle was originally built with a 15-foot span, the sleepers being supported by six stringers, 6 inch by 16 inch in cross-section. The demands of heavy modern equipment and intensive traffic conditions have been met, without any question of scrapping the old structure. It was merely necessary to double the number of supporting piles, and to add two 8 inch by 16 inch stringers, one on either side of the trestle, while the original stringers were moved a little nearer the centre line of the structure. The wood used throughout was pitch pine, the only economic equivalent of which to-day, is Douglas fir.

With the high state of perfection now reached in preservative treatment, the great disadvantage of timber has disappeared, and there is no doubt that it is to-day a satisfactory fabric for many types of marine work.

Dufferin and Spencer Docks, Belfast Harbour.

The Use of Timber in Marine Works—*continued*

The New York Waterfront. [Courtesy: U.S. Lines

That the suitability of timber is not confined to small and unimportant harbours is evident from the fact that some 549 miles of a total of 578 miles of New York's waterfront structures are of timber. The Chief Harbour Engineer attributes the rapid growth of New York Harbour largely to this fact, and the ease with which it has been possible to modify docking facilities to take larger and ever larger ships.

That modification of berthing facilities is an essential consideration in modern dock construction is indicated by the following record of necessary alterations in New York Harbour works to accommodate the increasing size of ocean-going shipping.

In 1872 the largest ship received was the "Oceanic," 425 ft. long, for which a dock of 450 ft. was provided;

In 1880 accommodation had to be provided for the "Arizona," 475 ft. long, with a 510-ft. pier;

In 1895 the "Campania," 625 ft. long, was provided with a berth 640 ft. long;

In 1903 the 727-ft. long "Baltic" required 740 ft. of docking accommodation;

In 1920 came the "Majestic," with a dock of 1,000 ft.

And in 1935, the "Normandie," for which an 1,100-ft. pier was opened last summer.

In the United Kingdom only two ports have taken advantage of the possibilities of timber in harbour works. These are Falmouth, where creosoted Douglas fir has been employed in dock construction over the past ten or twelve years; and Belfast where timber quays have been in service for some thirty years.

In Belfast Harbour creosoted Douglas fir has been employed in large quantities since 1919, mainly in the construction of the Pollock Dock and Pollock Basin Quays, and in the Dufferin and Spencer Dock Quays, where berths are provided of a total length of 1,960 ft., with a depth of 30 ft. at low water.

Traffic at Roumanian Ports

The goods exported over the harbour of Constanta during the year 1935 consisted mainly of petroleum, grain, cattle, and wood. The shipments of petroleum products, the principal export article of the country, alone amounted to 5,104,537 tons. The grain shipments, on the other hand, suffered a considerable decline. Whilst in 1933, 692,007 tons of grain were still exported over Constanta, this figure declined, in 1934, to 326,196 tons, and in 1935 to only 218,935 tons. As a result of the increased demand from Palestine and Greece, the exports of cattle from the premier Roumanian sea harbour rose considerably, from 10,274 tons in 1934 to 29,324 tons in 1935. The total Roumanian exports over the harbour of Constanta amounted, in 1935, to 5,571,693 tons, as compared with 5,446,477 tons in 1934.

During the past few months, the position in the harbour of Braila has been growing steadily worse. In the middle of December, thirty steamers were waiting in the harbour, without any prospect of getting cargoes. In November and December, the warehouses of the harbour, which have a capacity of 150,000 tons, contained only 13,000-15,000 tons of goods. In the first nine months of 1935, 341,210 tons of goods were loaded on to 236 steamers, as compared with the 563,928 tons on 280 steamers of the same period of the previous year.

Shipping at Belgian Ports

In December, 1935, the harbour of Antwerp was visited by 1,025 sea-going vessels with 2,083,097 tons, as compared with 887 vessels with 1,816,672 tons in the same month of 1934. In spite of a severe drop in the traffic figures in the first months of 1935, a considerable improvement occurred after the devaluation of the belga. As a result, the traffic figures for the whole of the year are considerably larger than those for 1934. They total 11,125 vessels with a tonnage of 22,041,022 tons, as compared with 10,305 vessels with 20,556,384 tons in 1934. A particularly remarkable increase, from 1,540 to 2,049, occurred in the number of motor vessels, although this was counter-balanced by a decline in the actual tonnage.

In contrast to Antwerp, traffic in the harbour of Ghent was less in 1935 than in the previous year, amounting in the former to 1,755 sea-going vessels with a tonnage of 1,928,118 as against 1,929 vessels with 2,057,922 tons.

The number of sea-going vessels entering the Port of Brussels increased slightly, but both tonnage and cargo declined. In 1935, 1,769 vessels entered the port with a tonnage of 859,556 tons and cargoes of 688,594 tons. This represents a tonnage decline of 94,582 tons, and a cargo decline of 153,306 tons from the 1934 figures.

Irish Harbour Matters

Dublin Port and Docks Board.

AS there was no opposition to the candidates nominated as Traders' and Shipping Members of the Dublin Port and Docks Board on the 30th December, 1935, the following nominees were declared elected:—

Traders' Members: Mr. Michael Birmingham, Mr. George Connel Byrne, Mr. Wm. Joseph Kelly, Mr. Palk Leonard, and Mr. Matthew Joseph McCabe.

Shipping Members: Capt. Alan Samuel Gordon, Mr. Cecil Duxbury Hewat, Major James Bell Hollwey, and Mr. Thos. Franklin Laurie.

Mr. Wm. Joseph Kelly, who had been nominated as a Traders' Member, withdrew his candidature, and thus left the number of candidates barely sufficient to fill the vacancies.

The issue of £150,000 Four Per Cent. Redeemable Stock at £97 10s. by the Dublin Port and Docks Board have been oversubscribed three times, letters of allotment and regret have been posted. The object of this issue was to repay money borrowed from the bank for the purpose of new capital works, payment for the completion of these works, and such contemplated works actually started.

One of the largest operations undertaken during the year was the building, at an estimated all-in cost of about £68,000, of a new tobacco store within the Custom House Docks premises. This work is now nearing completion. The present stores have a capacity of 7,000 hogsheads of tobacco, but the new store will accommodate from 15,000 to 20,000 hogsheads of home and foreign tobacco leaf. Within recent years there has been increased activity at Custom House Docks, while in the vicinity of George's Dock two up-to-date traffic bridges have been erected. To keep the channel clear enough to receive vessels of deep draught, a considerable amount of dredging was done during the year. In order to complete the dredging programme in contemplation, it will be necessary to have a double shift in operation next summer. It is likely, therefore, that a considerable sum will be allocated to this work.

Sailings from Dublin to New York.

Four vessels of the Anchor Line will be used in the new fortnightly service between Dublin and New York, which will start on May 9th and continue until September 12th. The first ship, the 16,800-ton s.s. "California," will sail for New York on May 9th. The "Transylvania," a 17,000-ton ship, will leave New York for Dublin on May 8th. The crossing will take seven days. In addition, two other ships, the 17,000-ton liner, "Cameronia," and the "Caledonia" (16,300 tons), will make some of the Dublin-New York crossings, which will alternate with sailings from Belfast and Londonderry. According to present plans, the last sailings will be from Dublin on September 12th, and New York on August 22nd.

Cork Harbour Board: Heavy Tonnage.

Statistical returns submitted to a meeting of the Cork Harbour Board, held on January 8th, indicated that during 1935, 1,687 vessels entered the port, representing a tonnage of 3,762,392. This included 231 trans-Atlantic liners, which accounted for a tonnage of 2,864,252.

Under the heading of passengers and mails traffic, it was shown that 8,444 passengers came from across the Atlantic and 1,590 from cross-Channel and Continental ports, while 5,608 travelled from Cork to America, and 1,407 to cross-Channel and Continental ports. Some 21,171 sacks of mails arrived, and 16,582 sacks were sent out.

The Cork Steam Packet Company's services' return indicated that 21,828 passengers arrived and 24,269 left, while 591 arrived and 636 left on the Clyde Shipping Company's services.

The total number of passengers, inward and outward, that passed through the port in 1935 was 63,833.

Mr. Crowley expressed satisfaction at the total tonnage and the number of passengers carried. He thought their tonnage was the largest in the Free State, and second in Ireland only to Belfast, which, as a shipping centre, was specially favoured. The most gratifying feature was that all this traffic was handled without mishap. He noticed that since 1926 they had what might be described as an adverse balance regarding the number of passengers leaving the Free State, and those coming in. In 1934, 48,000 more passengers left than entered, and in nine months, in 1935, 20,000 more left Ireland than came in. He suggested that efforts should be made to get cruising liners to call at Cork.

Mr. R. Wallace said that the handling of such a large volume of traffic and mails was a great tribute to the port of Cork.

The Chairman (Mr. J. C. Rohan) agreed, and said he was hopeful of a better tourist season this year.

Lights in Cork Harbour.

At the same meeting of the Cork Harbour Board, a letter was received from the Irish Lights Commissioners conveying sanction to the proposed alterations in the lights in Cork Harbour and the River Lee, but pointing out that the proposed changes were not in accordance with the draft rules and draft agreement for a uniform system of buoyage at present being considered by the League of Nations. In the event of international ratification of draft rules and draft agreement, the Cork Harbour Commissioners would be required to alter the colour of their buoys, reverse the colour of the lights exhibited from them, and adjust the numbering of the buoys.

Mr. Gayer, General Manager, said that the scheme would involve the Board in an expense of over £400.

The matter was referred back to the Committee in charge of the matter.

Limerick Harbour Receipts.

According to the annual report of Limerick Harbour Board, 323 vessels totalling 181,694 tons entered Limerick port last year, a decrease of five vessels and 33,808 tons. The revenue was £9,447, a decrease of £2,916, while the total drop in tonnage was 16 per cent.

The accounts for the year show a decrease in import dues of approximately £1,525, and an increase in export dues of about £250. Receipts from tonnage and goods rates showed a decrease of £4,193, and from all services about £5,200. Allowing £2,000 odd for depreciation, the Secretary estimates a surplus of £4,500. The Secretary, in commenting on the report, stated that the difference between £4,193 and £5,200, which was the total decline, represented a loss of approximately £900 in interest on their investments. The surplus revenue, he said, had fallen from £10,000 to £4,000, but would be sufficient to pay the contractor for the dock extension.

The fall in revenue was due solely to a falling off in wheat and timber imports. During the year there was a decrease of 28,000 tons of wheat and 18,600 tons of timber.

The Port of Amsterdam

Statistics for the Port of Amsterdam in regard to number of vessels and tonnage and to goods traffic arrived and sailed, as compared with the corresponding figures of last year, are as follows:—

SEAGOING VESSELS AND TONNAGE.

	ARRIVALS				SAILINGS			
	No.	Per Cent.	N.R.T.	Per Cent.	No.	Per Cent.	N.R.T.	Per Cent.
Dec. 1934 ...	252		381,579		244		363,710	
,, 1935 ...	244		342,674		232		343,170	
	—8	—3·17	—38,905	—10·20	—12	—4·92	—20,540	—5·65
Nov. 1935 ...	254		350,845		255		333,230	
Dec 1935 ...	244		342,674		232		343,170	
	—10	—3·94	—8,171	—2·33	—23	—9·02	+9,940	+2·98
Jan.-Dec. '34	3,222		4,638,017		3,236		4,654,457	
,, '35	2,893		4,178,271		2,905		4,234,383	
	—329	—10·21	—459,746	—9·91	—331	—10·23	—420,074	—9·03

SEAGOING GOODS TRAFFIC.
(In Tons of 1000 Kilos*).

	1 Import	2 Transit incl. in col. 1	3 Export	4 Transit incl. in col. 3	5 Total col. 1 & 3
Nov. 1934	326,237	74,793	157,307	75,670	483,544
,, 1935	277,255	66,468	165,936	67,284	443,191
	—48,982	—8,325	+8,629	—7,786	—40,353
	—15·01%	—11·13%	+5·49%	—10·37%	—8·35%
Oct. 1935	299,800	55,638	172,814	71,955	472,614
Nov. 1935	277,255	66,468	165,936	67,284	443,191
	—22,545	+10,830	—6,878	—4,671	—29,423
	—7·52%	+19·47%	—3·98%	—6·49%	—6·23%
Jan.-Nov. 1934 ...	3,381,573	671,479	1,537,223	651,675	4,918,796
,, 1935 ...	2,918,520	643,844	1,608,464	693,899	4,526,984
	—463,053	—27,635	+71,241	+42,224	—391,812
	—13·69%	—4·12%	+4·63%	+6·48%	—7·97%

* These figures have been taken from the monthly statistics of the Central Bureau, The Hague, Holland.

Classified according to flag the number of vessels which entered the Port of Amsterdam during December, 1935, was: Netherlands, 130; Great Britain, 50; German, 19; Swedish, 16; Norwegian, 16; American, 1; French, 1; Spanish, 1; Lettish, 1; Finnish, 1; Italian, 1; Belgian, 2; Russian, 5.

Vessels laid-up at Amsterdam:—1st December, 1935—8 vessels, measuring 54,682 tons gross; 1st January, 1935—14 vessels, measuring 94,437 tons gross; 1st January, 1936—7 vessels, measuring 50,747 tons gross.

North-East Coast Notes

North-East Coast Trade Prospects.

THE bright spot in the trade of the North-East Coast at the beginning of 1936 was the outlook for greatly increased activity in the shipyards in the area. Many orders have been placed during the past couple of months, and these will provide work in most of the shipyards for the first quarter of the year. In regard to the coal trade it was overshadowed by the threat of a "stoppage" at the mines before the first month ended as a result of a dispute as to wages. The shipments in the past year, with almost the solitary exception of Blyth (which set up another record), were not in the main satisfactory. Blyth shipments totalled 6,503,606 tons, 41,960 tons more than in the previous year, which was itself a record. The Tyne's total of 13,351,379 showed a reduction of 729,137 tons on 1934. This diminution was almost entirely attributable to the loss of Italian trade. The year's total for the Wear was not to hand at the time of writing, but the eleven months' total of 3,496,592 tons was 152,920 tons below the figure of 1934. The coal and coke shipments from the Hartlepools were 3,435,802 tons, 120,550 tons more than 1934, an increase of 3.62 per cent.

Mr. W. A. Souter, presenting the report of the Docks and Trade Committee at the December meeting of the Tyne Improvement Commission, referred to the fall in shipments, and said Italy had been very largely responsible for lower coal despatches from the port, for their shipments to that country were half a million tons less than last year. There had been decreases also in the exports to France, Holland and Belgium. The chairman of the committee had, added Mr. Souter, interviewed representatives of the teemers and trimmers employed at Whitehall Point and Albert Edward Dock coal-shipping staiths on a proposal which he put to them, on behalf of the Commissioners, for the establishment of three-shift working, when required, at those staiths. He found them very reasonable, but they thought the volume of trade did not justify a third shift, either partially or wholly. If trade increased, however, they promised to reconsider the proposal.

Meeting of Tyne Improvement Commission.

Sir Arthur M. Sutherland, Bart., presiding at the December meeting of the Tyne Improvement Commission, welcomed two new members, Mr. B. E. Common and Mr. Harry Tully, recalling that the latter was the son of the late Mr. J. E. Tully, one of the most hard-working members of the Port Authority for many years. Mr. Harry P. Everett, the ex-chairman, was congratulated on his appointment by the Ministry of Transport as life Commissioner in place of the late Lord Kirkley. Presenting the report of the Finance Committee in the absence of Mr. F. Priestman, Sir Arthur remarked that it was satisfactory to know they were able to get all the money they needed at 3 per cent.

The Story of the Tyne.

The Secretary of the Tyne Improvement Commission (Mr. Albert Blacklock), addressed the members of Newcastle District Association of Chartered Shipbrokers in December, on the subject of "The Port by which we live." The Tyne, he said, was a great waterway, for what nature denied had been provided by man. The Tyne Improvement Commission came into being in 1850, and there commenced a new era for the Tyne, during which a shallow and tortuous stream was transformed into a first-class port. New works followed, among the first being the Northumberland Dock and the North and South Piers. From 1850 to the present time 160,000,000 tons had been dredged from the river and dumped at sea at a cost of about £3,000,000. The physical improvement of the river was reflected in a greater volume of trade. In 1851 exports of coal were 3¾ million tons; in 1866 between 5 and 6 million tons, and in 1923, the record year, the total was 21½ million tons. For a period of ten years the trade of the Tyne had been depressed, and it came as a shock to see the volume dwindle to under 13 million tons. It came as a shock, too, that the number and tonnage of ships passing through the port should fall from 11,000 a year with a tonnage of over 12 millions, to 8,000 and a tonnage of under nine millions. Each million tons of coal meant £25,000 to the Commission. Mr. Blacklock concluded by stating how the financial policy of the Commissioners had placed the Commission on a sound basis, instancing the fact that while at the end of 1934 they had spent nearly £8,000,000 in making the river, the amount which they had on loan is just over £3,000,000. At present the Commissioners had before them a number of schemes which, if carried out, would benefit not only the Tyne as a port, but would be a valuable contribution to the steps that were being taken to recondition industry on the North-East Coast.

River Wear Finances.

Reference to the financial commitments of the Council in regard to the River Wear Commission caused a discussion at a meeting of Sunderland Town Council in December, which ended in the adoption of a resolution moved by Councillor W. S. Martin, that a special committee be set up to examine the finances of the Commission in so far as they affected the Council. The report of the Finance Committee showed that the Council had to provide £20,000 to enable the River Wear Commission to pay in full the half-yearly annuities on the second mortgage funded debt, which fell due at the end of the year. Councillor Martin said the Council was under a statutory obligation, but if the Council had to pay they had a right to a greater say in the management of the Commission. The Council had advanced a total sum of £140,000 to the Commission.

Alderman Eden Johnston pointed out that Sunderland charged the third highest tariffs of all the ports in England. He thought that that aspect required consideration. Alderman Cairns said that although the Corporation had to borrow the money, the River Wear Commission paid the interest, and this statement was supplemented by Alderman Sir Walter Raine, who said that until recently the River Wear Commission had been paying 5 per cent. on the money which the Council borrowed at 3 per cent.

At a meeting of the River Wear Commissioners about a week later, Mr. J. E. Dawson, Chairman, replied to the remarks at the Sunderland Town Council. Mr. Dawson said it was a pity that that kind of thing should be discussed publicly in the town. He was one of those who originated co-operative action between the Corporation and the Commissioners for the benefit of the port, and, therefore, of the town, but some new members of the Council were now taking up an attitude which was to be deprecated. They were simply floundering in criticisms which they were not competent to make because they did not know the facts. He did not know whether the committee of inquiry was to be appointed to confer with them or whether it was to come in a spirit of aggression. "But," he declared, "if they come in the right spirit they will get all the information which they can reasonably expect." Proceeding, Mr. Dawson said the Commissioners were suffering from an insufficiency of revenue. They had cut down their expenses as far as they could without impairing efficiency, but there were overhead charges which must be met. One of those charges that year was a sum of £12,000 for redeeming mortgages, and funded debt, and £6,000 was required to pay interest on borrowings from the Corporation. These two amounts went far to account for the £20,000 which the Corporation had to find to meet the Commissioner's deficiency that year. The Commissioners' chief trouble was the decline in coal shipments. The shipmerts would barely reach four million tons that year—a drop of a million tons on their normal shipments.

The Port of Rotterdam

The Chamber of Commerce and Industry of Rotterdam has recently issued the statistics concerning the movement of seagoing ships in the New Waterway, and which are as follows: During December, 1935, 1,024 ships with a net registered tonnage of 1,670,164 entered the Port of Rotterdam, as compared with 956 ships of 1,468,396 n.r.t. during December, 1934. The number of ships entering for the small ports in the environs were 192 of 377,654 n.r.t., as compared with 173 ships of 337,479 n.r.t. in December, 1934.

For the twelve months ending December, 1935, 11,126 ships of 18,029,404 n.r.t. entered the Port of Rotterdam, as compared with 11,436 ships of 17,974,408 n.r.t. for the corresponding period of 1934. The number of ships entering the Port of Rotterdam for the small ports in the environs for the twelve months ending December, 1935, amounted to 2,300 ships of 4,723,572 n.r.t., as compared with 2,489 ships of 4,489,274 n.r.t. for the corresponding period of 1934.

After deducting the number of ships counted more than once in the different ports, the number of entrances during the month of December, 1935, amounted to 1,169 ships of 1,914,692 n.r.t., as compared with 1,082 ships of 1,684,011 n.r.t. in December, 1934. For the twelve months ending December, 1935, the total entrances were 12,813 ships of 20,933,244 n.r.t., as compared with 13,276 ships of 20,962,096 n.r.t. for the corresponding period of 1934. These figures are for the whole region of the Port of Rotterdam with its environs, comprising the delta formed by the mouths of the Rivers Rhine and Meuse.

News from all Quarters

South Africa

DURBAN HARBOUR experienced record activity during the past year, abnormally heavy shipping and greater tonnages of cargo being handled practically every month.

The total tonnage of imports to be landed from January to the end of November, 1935, was 1,518,675 tons, compared with 1,294,000 tons landed during the same period in 1934. Exports over the same period in both years totalled 1,185,668 and 792,839 tons respectively.

The effect of the diversion of ships from the Suez route and the general improvement of shipping in the Far East have resulted in a great demand for Natal coal, and during the last few months of the year the amount shipped from Durban has been unusually large. The total tonnage of bunker coal shipped during the year amounted to 765,507 tons, whilst coal shipped as cargoes aggregated 969,001 tons. During the previous year only 653,597 tons of bunker coal and 718,252 tons of cargo coal left the port.

U.S.A.

The plans for providing New York with a free harbour, which were examined by various public bodies several months ago, have now been rejected by the Harbour Committee of the Chamber of Trade of the State of New York. The Committee states that New York already possesses a sufficient number of bonded warehouses for its needs. Indeed, the available capacity is only being utilised at present to 60 per cent. The fact that the proposed free harbour was to have been situated at Staten Island made the scheme still less feasible. The shipping lines would find it uneconomic for their vessels to call first at Staten Island to land transit goods which would usually make up a comparatively small proportion of their total cargoes. The Committee recommended that, as a first alternative, transit goods should be transhipped direct from one vessel to another. This would be a simple matter owing to the frequency of the departure of cargo vessels from New York. As a second alternative, goods should be stored in the bonded warehouses already available until they could be re-shipped. Even if the free harbour were to be established, its existence could not be justified by the use made of it, as the American free harbour law, unlike that of other countries, would not permit the treatment or exhibition of goods in the free harbour area.

Canada

The traffic figures for the harbour of Churchill, which have been increasing rapidly during the past few years, have suffered a set-back. Only 2,407,000 bushels of wheat were despatched via the Hudson's Bay Route during the grain-shipping season which has just concluded. This compares most favourably with the figure for the year 1934 of 4,050,000 bushels, which was the largest ever registered in the harbour. It is stated that since 1931 altogether 12,446,000 bushels of wheat have been shipped from Churchill, nearly 85 per cent. of the total wheat exports from the harbour being delivered by the Saskatchewan Wheat Pool.

Brazil

The most important goods exported from the harbour of Santos during the third quarter of 1935 were some 2,700,000 sacks of coffee (each sack weighing 60 kg.) and 159,575 bales of cotton. The country represented by the greatest number of its vessels to visit the harbour was Brazil itself, 309 Brazilian vessels with a tonnage of 419,776 tons entering, and 303 vessels with 404,665 clearing. The greatest tonnage, however, was that of the British vessels, 118 with a tonnage of 723,495 entering, and 119 with a tonnage of 724,913 tons clearing.

Portuguese East Africa

The total shipping in the harbours of Portuguese East Africa showed in 1934 a considerable improvement over that of the previous year. Both the total number of arrivals and the total gross tonnage increased, whilst the amount of cargo unloaded and transhipped developed in still more remarkable fashion. All the harbours of the Colony, however, did not profit equally from the improvement. The ocean-going traffic, in which the three leading harbours of Lourenco Marques, Beira, and Mocambique are principally concerned, developed in the more satisfactory fashion. The volume of the coastal traffic, on the other hand, showed a tendency to decline, the amount of cargo unloaded falling. This chiefly affected the smaller harbours, including Porto Amelia, Ibo, Mocimboa da Prais, and Quelimane, although in most of them the loss was partly counter-balanced by increasing exports. Lourenco Marques and Beira are now far ahead of all the other ports, and are the only ones fully equipped with up-to-date cranes and adequate quays. They owe their importance mainly to the development of the transit traffic to the Transvaal, Rhodesia, and the Belgian Congo. The harbour of Mocambique still serves mainly as an outlet for the produce of its hinterland, but, as this includes the most important producing section of the Colony, the harbour is always sure of handling a reasonably large share of the total traffic.

French Possessions

The provision of additional cranes and other facilities at the harbour of Casablanca in French Morocco is now being carried out under the direction of the Public Works Department. When the work is completed, the capacity of the harbour will be considerably increased.

Manchukuo

In November, 1935, 470 steamers with a total tonnage of 1,265,915 tons visited the harbour of Dairen. This represents an increase of 21 steamers, but a decrease of 100,414 tons from the figures for the same month of the previous year. The total amount of goods imported over Dairen in November, 1935, was 208,288 tons—a decrease of 5,741 tons from the October figure and of 54,000 tons from the figure for November, 1934.

The trade turnover of the harbour of Seishin in North Korea amounted, in November, 1935, to some 4,600,000 Yen, which was larger by 1,500,000 Yen than the figure for the same month of the previous year. The total imports and exports for the first eleven months of 1935 amounted to 45,400,000 Yen, or 11,800,000 Yen more than in the same period of the previous year.

U.S.S.R.

The following table, based on official sources, shows in thousands of tons the total exports of goods over Soviet harbours, together with the shares of the principal ports:—

	1932	1933	1934	1935 Jan.-Sep.	1934 Jan.-Sep.
Total Exports	17,550	17,920	17,340	12,175	12,912
Amounts handled in—					
Archangel	1,351	1,496	1,618	1,405	1,337
Murmansk	383	465	672	413	502
Vladivostock	229	232	54	7	39
Leningrad	2,893	3,763	3,920	2,600	2,895
Odessa	932	565	517	470	400
Nikolaev	474	893	799	727	583
Novorossisk	1,333	1,388	1,123	618	871
Poti	336	514	637	425	485
Touapse	1,479	867	654	319	536
Mariupol	1,272	1,276	1,309	903	858
Batum	3,727	3,289	3,099	1,933	2,268
Baku	94	90	106	105	61

After slightly increasing from 17,550,000 tons in 1932 to 17,920,000 tons in 1933, exports over Soviet harbours fell again to 17,340,000 tons in 1934. This decline of 580,000 tons has in its turn been followed in the first nine months of 1935 by a further drop of 737,000 tons, as compared with the same period of the previous year. The exports over Archangel, the third port of Russia, after Leningrad and Batum, have shown an improvement in 1935, whilst those of Leningrad have declined during the first nine months of the year by no less than 295,000 tons. The decline in the export of nitrate from Batoum, noticed for several years past, has been further accentuated in 1935. Whilst progress has been made this year in the export of coal from Mariupol, and of coal and minerals from Nicolaev, exports from Novorossisk, Poti, and, above all, from Touapse, have fallen.

The only harbour of Northern Russia to remain open this year throughout the winter months is Murmansk. Traffic in the commercial harbour of Leningrad ceased on December 15th, as far as incoming foreign vessels were concerned, whilst the latest date for outgoing foreign vessels was December 25th. No provision was made for the maintenance of an ice-breaker service through January.

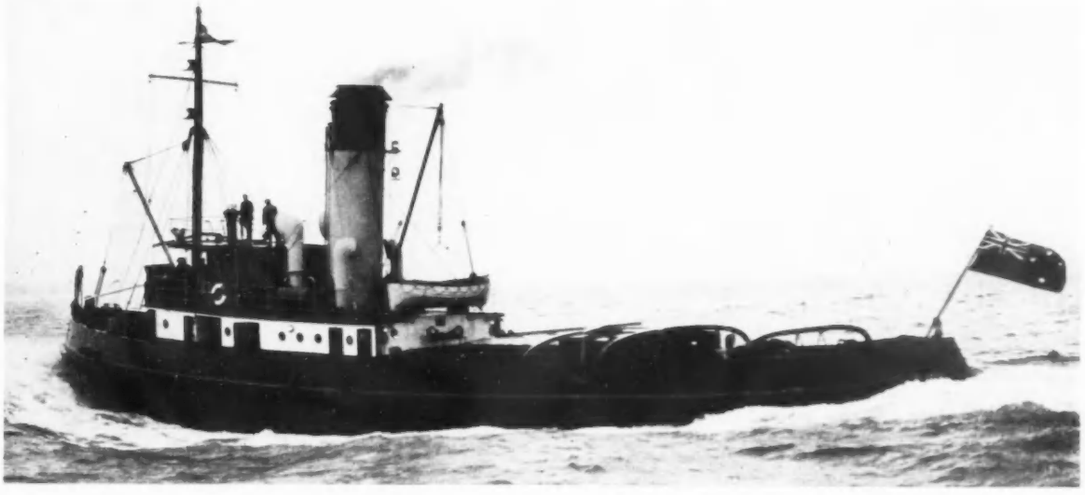
Danzig

The number of vessels entering the harbour of Danzig during the month of November, 1935, was 365 with a tonnage of 258,600 n.r.t., and the number clearing 377 with 270,300 n.r.t. The goods turnover of the harbour for the whole of 1935 was 5,200,000 tons, a decline of 1,200,000 tons from the previous year's figure. Whilst the export turnover fell by 1,300,000 tons, the import turnover rose by 17 per cent.

Twin-screw Tug "William C. Daldy"

Built for the Auckland Harbour Board, New Zealand, by Lobnitz & Co., Ltd., Renfrew

THE twin-crew tug "William C. Daldy," photograph of which we publish herewith, has recently been completed by Lobnitz and Co., Ltd., Renfrew, for the Auckland Harbour Board, New Zealand. The design and specification were prepared by E. H. Mitchell and Co., Consulting Naval Architects, Newcastle-on-Tyne, to meet the special requirements of Auckland Harbour Board and their Engineer, Mr. D. Holderness, M.Inst.C.E., and the vessel has been built under their supervision. She is classed 100 A.1 at Lloyd's for towing services.



The Twin-screw Tug "William C. Daldy."

The main requirements were that the length overall should not exceed 125 ft., the tow rope pull to be as great as possible, good manœuvring qualities, the super-structure kept well inboard to enable the tug to work close in under the flared bows of steamers, and the bows specially constructed for pushing.

The following are the principal dimensions:—

Length between perpendicular, 117 ft. 6 in.; breadth moulded, 32 ft.; depth moulded, 15 ft.; mean draught 12 ft. 6 in.; deadweight, 150 tons.

The outer bottom plating was pickled to remove the mill scale before painting, so as to avoid the scaling which usually takes place some months after a vessel is launched. The upper deck is completely plated and sheathed with teak and the boat deck and navigating bridge are of teak. A large teak deckhouse is fitted, comprising a wheelhouse and captain's cabin, and an upper bridge with steering wheel, standard compass, and telegraph, is fitted above this. Ample accommodation for the crew is provided on the lower deck forward, and officers' quarters and mess room are fitted on the lower deck aft.

The windlass is by Clarke, Chapman and Co., Ltd., and has an additional centre drum with separate brake and clutch for working the wire rope fall from the derrick when working heavy loads. A winch for handling tow ropes, etc., also by Clarke, Chapman and Co., Ltd., is fitted aft. The steering gear is of the combined hand and steam type, by Thomas Reid and Sons, Paisley, and is fitted at the after-end of the engine casing, controlled by shafting from the wheelhouse and upper bridge and by a hand wheel at the engine. The compasses are of Hughes deadbeat type, and double faced reply telegraphs with ahead and astern indicators are fitted in the wheelhouse and on the navigating and upper bridges.

The electric light installation was fitted by J. Charters and Co., of Glasgow. The dynamo is of 6 kilowatts capacity with engine by Messrs. Sisson and Co., Ltd., and generator by W. H. Allen, Sons and Co., Ltd. In addition to the usual lighting, two 300 watt floodlights are fitted, also a Morse masthead light, and two electric fans in the engine room ventilators. A "Monarch" patent shock absorbing towing hook by the Monarch Controller Co., Ltd., of London, capable of taking a pull of 19 tons, is fitted in addition to the ordinary towing hooks.

The main propelling machinery consists of two triple expansion steam engines of Lobnitz design and make, having cylinders 15 in., 25 in. and 40 in. diameter, with a stroke of 30 in. The H.P. cylinder has a piston valve fitted with Moss Philip rings, and the I.P. and L.P. valves are of the Andrews and Cameron type. Lockwood and Carlisle piston rings are fitted to all the pistons and U.S. metallic packing to all piston and valve rods. A single condenser is provided for the two engines, placed athwartship at the after-end of the engine room. Two independent air pumps of Weir's design and make are fitted and the circulating pump is of Drysdale's centrifugal type. The boiler feed pump are by G. and J. Weir, each capable of dealing with the entire feed for the two boilers. In addition to these, a general service pump, bilge pump, and fresh water pump, are fitted, all of Dawson and Downie's vertical duplex type. A Hocking combined feed heater and filter is also fitted.

The boilers are of the cylindrical type fitted with Howden's forced draft, and were built by Barclay Curle and Co. They are 13 ft. 6 in. diameter by 11 ft. 6 in. length and are fitted for coal burning.

Before sailing for New Zealand the vessel was put through exhaustive trials, the mean speed of two runs on the mile being 13.4 knots with the engines developing about 1,950 i.h.p. During a four hours trial the boilers gave ample steam, the machinery worked satisfactorily in every way, and there was a marked absence of vibration even in any of the propellers. The manœuvring qualities of the vessel were tested both ahead and astern and found very satisfactory and with one engine ahead and one astern she turned rapidly on her keel. A trial of the two rope pull was also carried out in the builder's basin, a mean pull of 17 tons being reached with a considerable margin of engine power still available.

The Port of Copenhagen.

The number of ships which entered the Port of Copenhagen during November, 1935, were as follows:—From inland ports, 1,169 steam and motor-ships arrived of 187,066 n.r.t., and 16 sailing vessels arrived of 3,500 n.r.t. Shipping arriving from foreign ports amounted to 743 steam and motor-ships of 113,357 n.r.t. and 22 sailing vessels of 7,303 n.r.t. The total of steam and motor-ships and sailing vessels arriving from both inland and foreign ports for November, 1935, amounted to 1,950 vessels of 611,226 n.r.t.

Port of Vancouver's Premier Position.

During the past fifteen years, largely as a result of the initiative of its Harbour Commission in steadily budgetting ahead of requirements, Vancouver has grown as a wheat centre until to-day it is the leading grain-exporting point in North America. With a total storage capacity of 17,843,000 bushels, it possesses the greatest grain storage facilities of any of the world's ocean ports, greater, in fact, than the total storage capacity of all Pacific coast harbours combined. Total grain shipments from the port for the crop year ending July 31st last amounted to 51,872,258 bushels.

Port of Algiers: The Mustapha Jetty–I

By M. PIERRE J. M. RENAUD, Ingenieur en chef des Ponts et Chaussées, Director of the Port

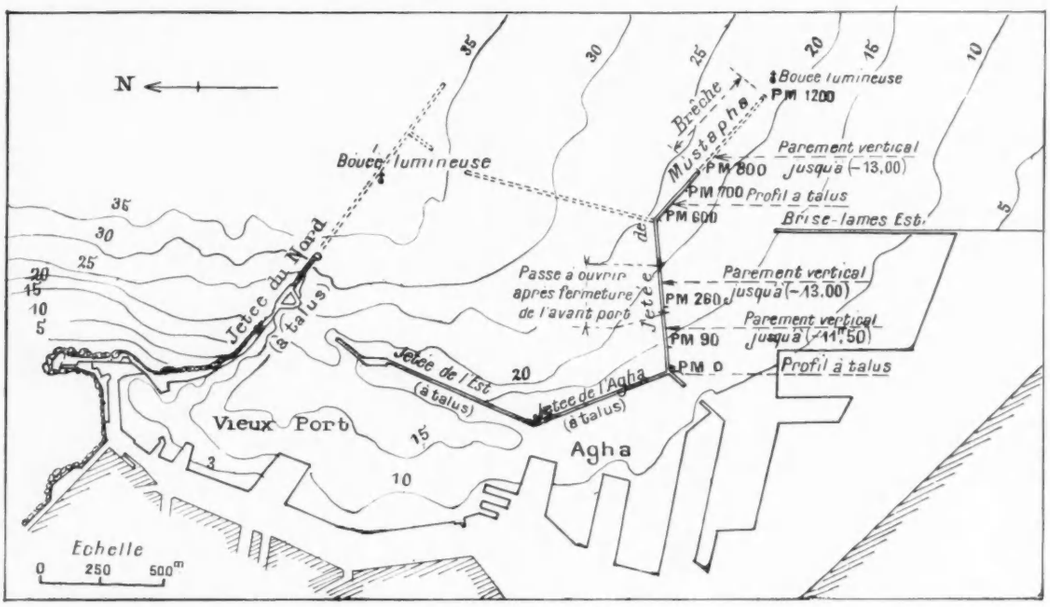


Fig. 1. Port of Algiers.

As an example among the various vertical-faced jetties or breakwaters constructed throughout the world during recent years, the Mustapha Jetty at the Port of Algiers has frequently received special mention by reason of the original features embodied in it and of its stability in resistance to the sea, which, until the 3rd of February, 1934, had been fully satisfactory.

It may not, therefore, be without interest to make known to engineers—on the one hand, the details of first construction of this work and the improvements which had been made from time to time therein; on the other hand, the circumstances in which, during a storm of greater violence than had hitherto been experienced in the Mediterranean, the breakwater for a length of 400 metres was completely destroyed.

This will be succeeded by a further article describing the results obtained from the extensive investigations, undertaken by the technical service of the Port, with the object of verifying theories and methods of calcu'ation relating to sea-walls. Thereafter will follow the conclusions which, in the Author's judgment, may be drawn from this example and from these investigations.

Part I

I—History of Construction

THE Mustapha Jetty, 1,200 metres ($\frac{3}{4}$ mile) in length, exists for the purpose of protecting a new basin—thus partially enclosed—about 60 hectares (15 acres) in area, whose construction was declared to be of "public utility" by a decree of 21st April, 1921. Its location is shown by Fig. 1.

The jetty—or breakwater—comprises two arms of equal length, inclined at an angle of 50° to one another and consisting of vertical-faced block-work walling, this form of construction having been selected after competitive comparison, which brought to light the economic advantages of this type in the judgment of all who have much experience of such construction.

Description of the Work.

According to full descriptions which were published in 1923 and 1928, respectively before and after construction, certain changes were made in the design. We give comparative outlines of the original section as selected in 1923 (Fig. 2) and of the section as built (Fig. 3) and will state the factors which influenced the originator of the project and the engineers who carried it out, leading them to retain some features and to modify others when carrying the proposal into execution.

The depth adopted for the foundation or base of the wall (—15 metres, or 49 ft.), although much lower than usual in works of this kind, was confirmed, for it created the best conditions for reflecting the swell and giving rise to the stationary wave of oscillation known by the name of "clapotis," and characterised by an amplitude which is double that of the primary wave approaching. It must be remembered that the duties of sloping mound breakwaters and of those with vertical faces are quite different and that, while with the former the object is to let the wave break on a slope of suitable length and gradient, with the latter it is desirable to obviate any tendency of the wave to break at all. The adoption of this very low foundation level had the further advantage of reducing the height of the rubble mound underneath, and consequently the amount of settlement. At the same time, the reduced spread of the rubble slopes reduced the liability to scour. Hence the risk of undermining appeared to be limited, since the natural depth of bottom at the site of the work was only about 20 metres, and the sand, although fine, was thoroughly consolidated and dense.

The widening of the lowest course of blockwork was maintained in the design, so as to reduce the alternating tendencies to overturn towards the harbour when the swell rose to its maximum, or outwards when it fell to a minimum. Other considerations of symmetrical forces and convenience of block-casting in the yard led to the adoption of a uniform thickness for the whole of the wall above the base blocks.

It was considered preferable to construct the wall of cyclopean blocks rather than caissons, which are generally admitted to possess the disadvantages of poor durability in sea-water of their thin reinforced concrete shells, poor adhesion of the concrete hearting to the shells, defects in the hearting and,

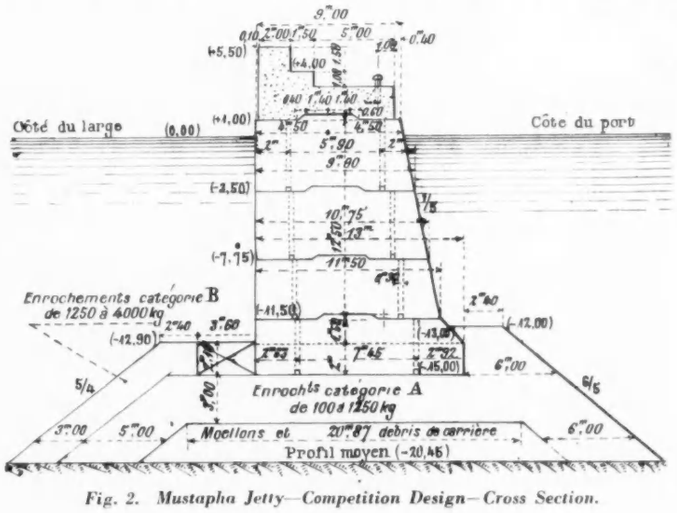


Fig. 2. Mustapha Jetty—Competition Design—Cross Section.

Port of Algiers—continued

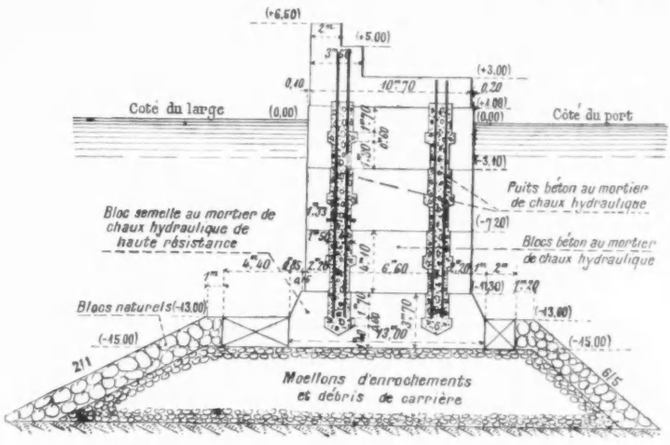


Fig. 3. Type Cross Section with Base at —15 m.

finally, the difficulty of construction in a port not over-well provided with dry-docks.

Resistance to overturning having been augmented by the increase of 2 metres in width of base, the question arose whether the resistance to sliding was adequate. It may be emphasised that at that date no vertical wall had yet been known to fail through insufficiency of resistance to shear; the accidents at Catania not occurring until 1930 and 1933, and those of Antofagasta (Chile) in 1928-9. But the method of calculation followed in 1923, as illustrated in Fig. 4, which gave the intensity of forces with sufficient accuracy for practical purposes, showed the desirability of increasing this resistance.

The mortises and tenons, as first intended, in the horizontal bearing faces of the solid blocks, which were to be lifted by steel rods embedded in the concrete or by small lewises, seemed open to serious objections. Their effectiveness depended upon positive contact between the meeting rebates, which would only be obtained after a slight displacement of the blocks, and this could not fail to induce cracking at the re-entrant angles. The solid blocks, with mortise keys, were therefore replaced by blocks having four vertical holes or hollow shafts, allowing the lewises of the lifting tackle to pass through them. The position of these shafts was so arranged as to avoid excessive reduction in thickness of their sides, which was never less than 1½ metres (5 feet), lest this should occasion fracture of the blocks.

These wide lewis holes, being continuous throughout the courses, were then to be filled with concrete, reinforced by steel rails, so as to lock together the several blocks of one group or column in a single mass by means of the reinforced concrete dowels thus formed. For a certain length of the jetty, between the chainage points of 290 and 430 metres, where it is intended eventually to open a passage of communication with the future outer basin, the steel rails were omitted and the shafts filled only with quarry waste capable of easy removal when the time should come. From chainage 90 to 290 and 430 to 1,030 metres, the reinforced concrete dowels were shortened because of the fears entertained, at one time, by certain engineers, that undesirable vibrations might result from the presence in the block-work of these rigid members, but they were restored to full length in the second branch of the jetty from chainage 1,030 onward.

The blocks were made of lime concrete, composed of broken stone, sea-sand or crusher-sand, and hydraulic or ordinary lime, and while the proportions varied, they were for the greater part of the work of the order of 4 : 2 : 1.

Lime was preferred to cement, notwithstanding its slower hardening, because lime concrete is more workable and because its heating and shrinkage, in large masses poured at the rate of 40 cubic metres an hour under an often blazing sun, are smaller than if cement were used.

The grading of the aggregate was carefully controlled and although the large size of the blocks precluded the satisfactory employment of vibration, yet it proved possible to obtain concrete of a density lying consistently between 2.4 and 2.45 tons per cubic metre, using a limestone of 2.67 specific gravity. This high density constitutes a major factor in the stability of the work.

Storm of 18th December, 1930.

The breakwater was in course of construction when, on the 18th of December, 1930, it was subjected to a storm of great violence, which caused serious damage to the Agha Jetty, a breakwater of the rubble mound type constructed in the period 1899-1912.

The characteristics even of this storm exceeded those which, on the evidence of all earlier records, had been taken as a basis of calculation, viz. :—

$$2h = 5 \text{ metres}; \quad 2L = 80 \text{ metres}.$$

The observed dimension was :—

$$2h = 6\tfrac{1}{2} \text{ metres},$$

which corresponds with an amplitude never before recorded, except at Genoa and Catania.

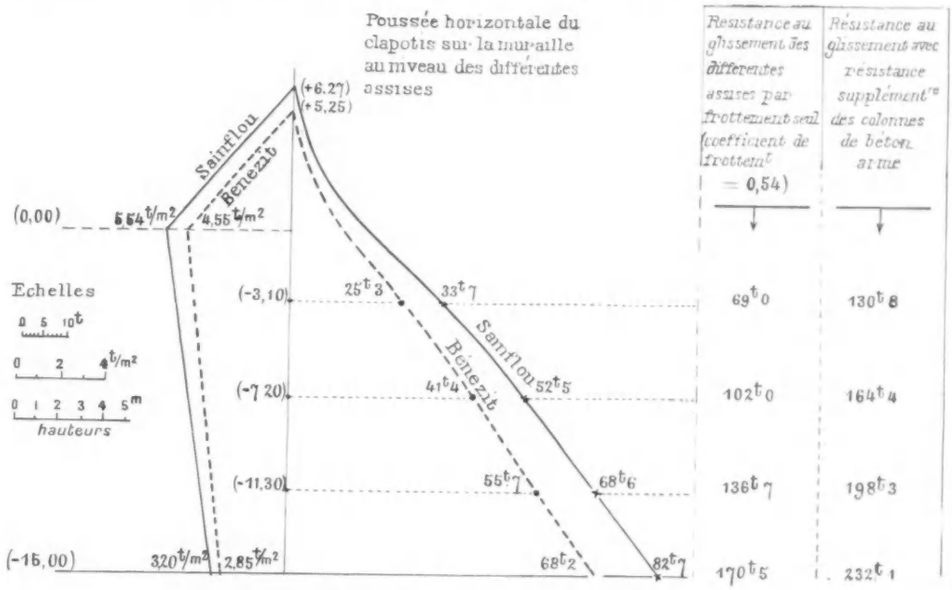


Fig. 4. Pressure Graph—Resistance to Shearing Forces.

Nevertheless, the jetty suffered no injury of any importance.

In the first arm, settlements were found, to the extent of ½ to 1 metre or thereabouts, and a few breakages of blocks. The settlements could easily be accounted for as being caused by ramming action upon the stone foundation mound by a new structure of block-work not yet carrying its capping wall throughout the full length.

The breakages of blocks were due to the following cause :—

During the storm the blocks change in position relative to each other, undergoing slight movements in an elliptical pathway, owing to the varying forces, which are out of phase. These movements reduce the thickness of joints or space between blocks by several centimetres even in a moderate sea, while in a gale the relative motion of the blocks is such as to close the joint completely and bring the surfaces into contact, which causes the spalling of blocks. These fractures are localised because, under the force of the sea, the deformation of the breakwater takes a sinusoid curvature in plan, as we will presently describe. The depressions of this sinusoid

Port of Algiers

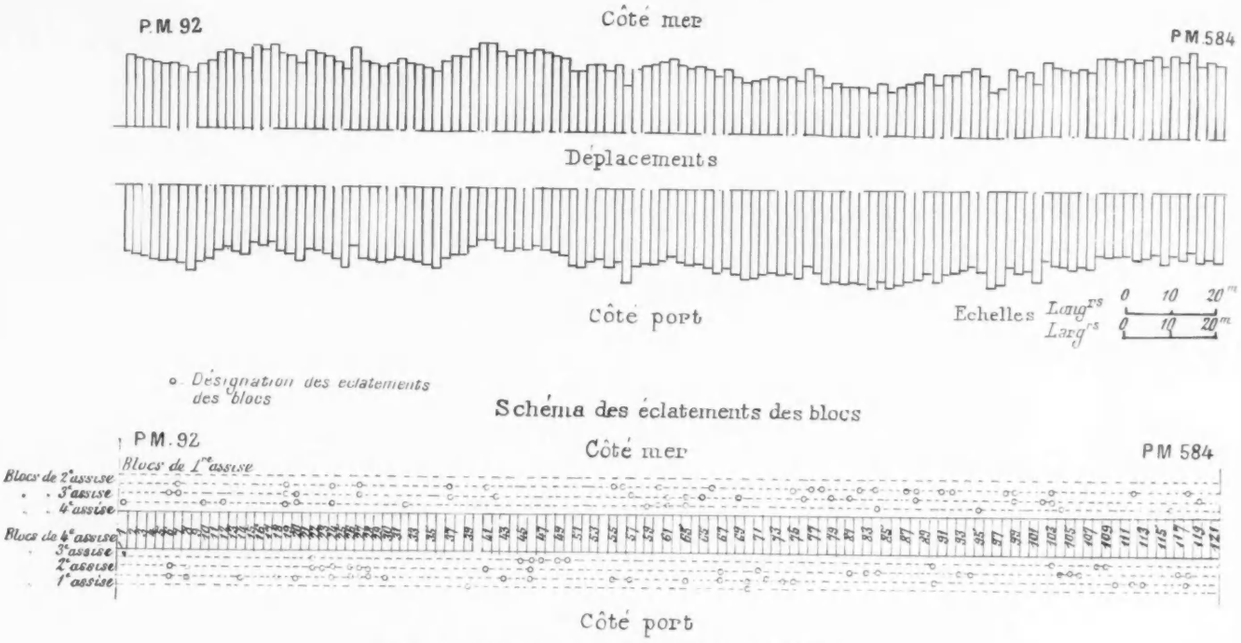


Fig. 5. Movements and Breakages of Blocks.

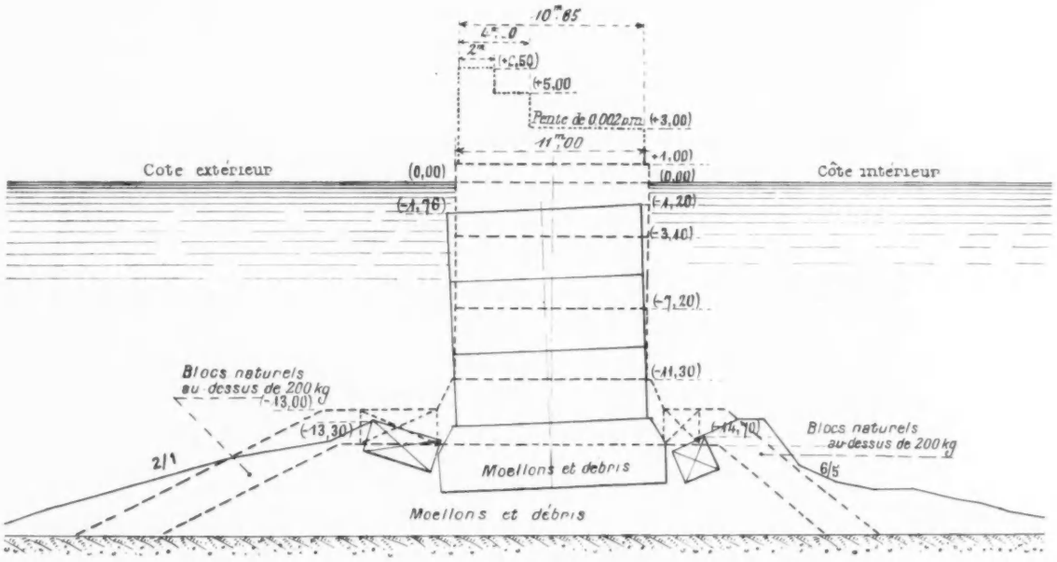


Fig. 6. Mustapha Jetty—Column 135. The broken lines shew the positions of wall blocks when erected. The dotted lines shew the capping wall and parapet, which were not yet built at the date of the storm. The full lines shew the condition after the storm.

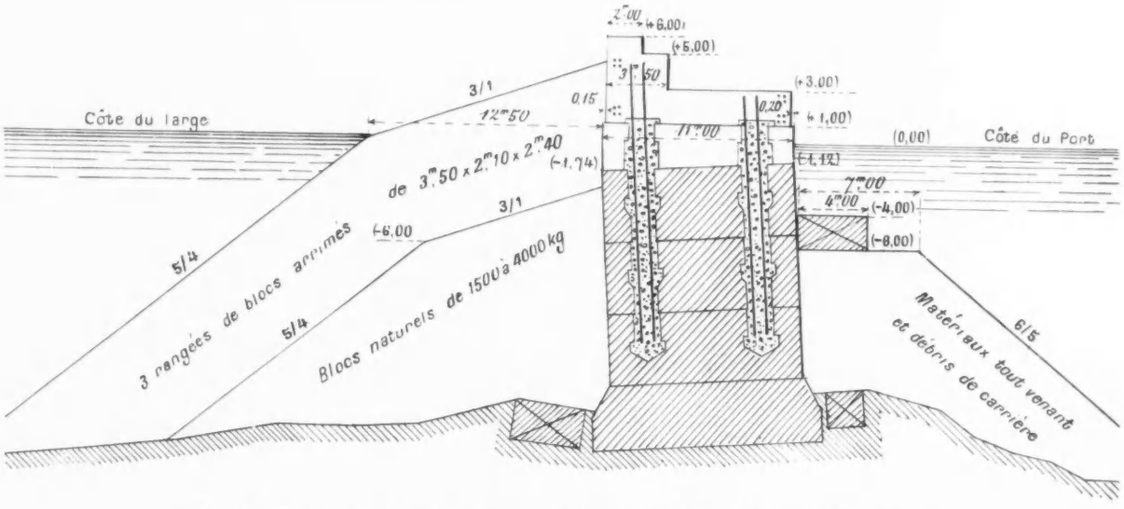


Fig. 7. Type Cross Section between Chainage Points 610 and 695 metres.

Port of Algiers—continued

curve evidently correspond with the points where maximum pressures were sustained: it was principally at these points that breakages occurred. (See Fig. 5).

At the second branch the effects were more serious: for a length of 90 metres from the root, the breakwater sank nearly 2 metres into its foundation while tilting 5 degrees outwards to the seaward side. The large blocks remained well bedded upon one another, notwithstanding several fractures, but the small apron blocks were carried down by the settlement of the structure and the edge of the berm was thus greatly blunted, though no sinkage of the natural bottom was observed. (See Fig. 6).

This rather novel phenomenon thus appeared to be due partly to the smaller material in the base mound being sucked out during the downward oscillation of the standing wave and partly to the breaking of waves over the top of the jetty which had progressively sunk beneath the water. This explanation still remains tenable at the present time.

the forces operating on the jetty would not be severe enough to cause settlements or other appreciable movements having any permanent effect beyond leaving their trace in the foundation.

A similar phenomenon was observed in the case of the jetty at the Mirabeau Basin in the Port of Marseilles, but the wave-length of the curve is shorter in that case, which is not surprising since the sea conditions are much less severe at Marseilles than at Algiers.

At Tuapse on the Black Sea, and at Catania in Sicily, curves have been observed having a wave-length of about 350 metres and of 120 metres respectively.

Works of "Monolithisation."

Such deformations and relative movements of blocks leading to fractures, through the sharp contact of parts bearing on one another, showed the desirability of rendering the structure so homogeneous that parts under severe momentary stress would

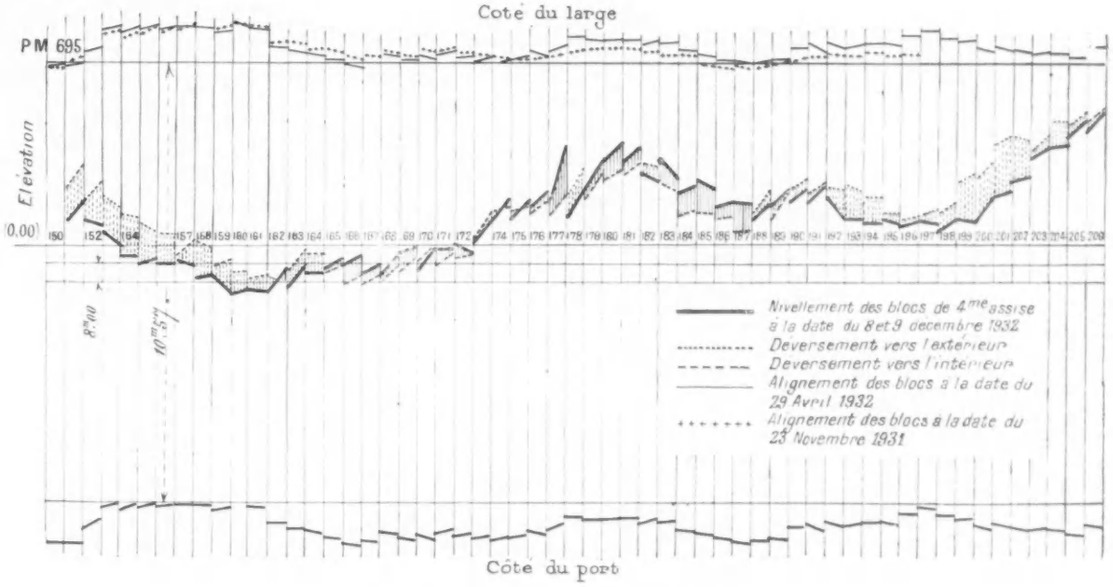


Fig. 8. Sinusoid Curve of Displacements.

Storm of 11th December, 1931.

One year later, on the 11th December, 1931, another storm of equal violence, which caused further damage to the Agha Jetty similar to that of the previous year, caused no fresh damage to the Mustapha Jetty, which appeared to have taken its final seating.

In these circumstances it was decided to repair the first 90 metres of the second branch of the jetty, by tipping against the face of it a bank of natural and artificial blocks—a simple and speedy solution, easy to be applied. On the other hand, as this part of the jetty would ultimately—upon the construction of the Eastern breakwater of the future outer harbour—form a re-entrant angle very openly exposed, it was desirable to provide against this by strengthening also on the inner side. (See Fig. 7).

The completion of the structure was carried out in accordance with the original profile, taking special care in the formation of the reinforced concrete jointing dowels.

Deformation of the Jetty.

Nevertheless, during the execution of these works, observations were still continued, especially those relating to mass deformations in the second arm of the breakwater.

As had been already noticed, at the end of 1930, in regard to the first arm, the deformations of the second arm took the form of a very regular sinusoid curve with a wave length of about 80 metres. If a graphical representation is made of the curves of settlements and of forward movements, it will be found that these curves both take the form of a sinusoid with approximately equal wave lengths and having their crests occurring at about the same points. (Fig. 8).

Experiments recently carried out and which will presently be described, having established that vertical-faced walls have no specific period of vibration, but yield to the caprice of the storm, it seems as if these sinusoid curves must be a consequence of deformations that occurred under the first storms of any violence, seeing that under seas of less strength

be relieved by the support of adjacent parts. Considerations of this nature had at first led to an attempt to attain the object in view by forming the blocks with vertical rebated joints, but experience showed this to be ineffective, and also to increase the risk of fracturing the blocks. It therefore appeared that it would be advantageous if the structure could be rendered monolithic by some means, after general settlement had occurred. Several projects had been under consideration with this object in view when the damage suffered by the jetty at the Port of Catania on the 26th March, 1933, brought into prominence the urgency of finding a solution to the problem.

At that date the Catania Jetty was carried away for 700 metres of its length by an East-South-East storm of the following characteristics, as regards wave height and length, viz.:—

2 h = 7.5 metres; 2 L = 225 metres.

The latter figure gives the apparent length of wave in the open sea, the periodicity being only 12 seconds. The length

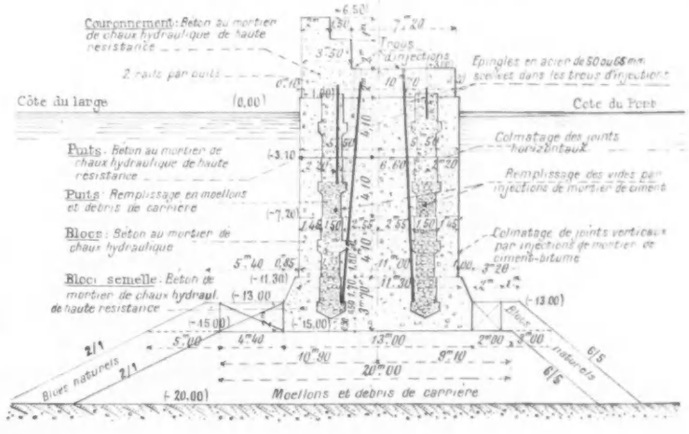


Fig. 9.

Port of Algiers—continued

of wave approaching the structure in a depth of 17 metres would therefore be of the order of 80 to 100 metres, according to the bottom slope in front of the jetty.

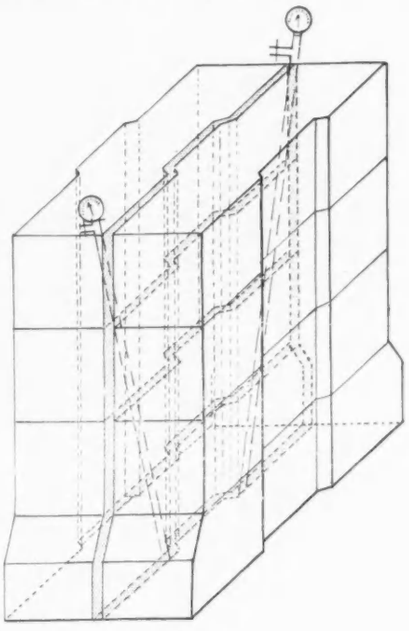


Fig. 10.

Examination of cross-sections shows that the collapse was due, as had also been the earlier failure at Catania in 1930, to insufficient resistance to shearing. The blocks had been simply bedded upon one another, without any jointing such as that effected at Algiers.

Nevertheless, and on account of the seriousness of the mishap, it seemed essential to take every precaution to prevent any like disaster from occurring at Algiers in the event of any gales occurring there of intensity equal to that of 26th March, 1933, at Catania.

A comprehensive programme was drawn up with the object of effecting the complete unification of the component parts of the jetty. This programme comprised two distinct parts:—

(1) Improvement of the bond between blocks of the same group, that is to say:—

(a) Completion of concreting in the vertical lewis holes in places where for any reason this had not been done and, for further security, the dowelling of blocks together by steel reinforcing bars of 2-inch and 2½-inch diameter, grouted into 4-inch holes bored for the purpose: (See fig. 9).

(b) Filling, by cement-grouting under pressure, of the thin joints between blocks and of the fissures in broken blocks.

(2) Sealing of the vertical joints between groups of blocks. (See Fig. 10).

The first part of this work presented no really serious difficulties beyond those named hereunder, which were easily overcome, viz.:—

(a) The presence of rails, in certain parts of the lewis holes, which were avoided by inserting the extra reintorcing bars diagonally, thus enabling them incidentally to act partly in tension or compression.

(b) Loss of substance, really very small by reason of the blocks having been cast on well-dressed beds, and even where surfaces were not perfectly true the roughnesses themselves sufficed to keep the injected materials in place under an easily regulated pressure.

The oscillation of water caused by swell in the lewis holes is moreover too weak to encourage the loss of material by running out of the joints

The second part of the work of "monolithisation" was much more delicate.

The first idea to occur to the mind was to begin by stopping the vertical face joints between columns of blocks by means of cement concrete in bags. This procedure had been followed at Marseilles in the Ste. Marie Jetty, but it was not practicable at Algiers because, for one thing, the joints were much

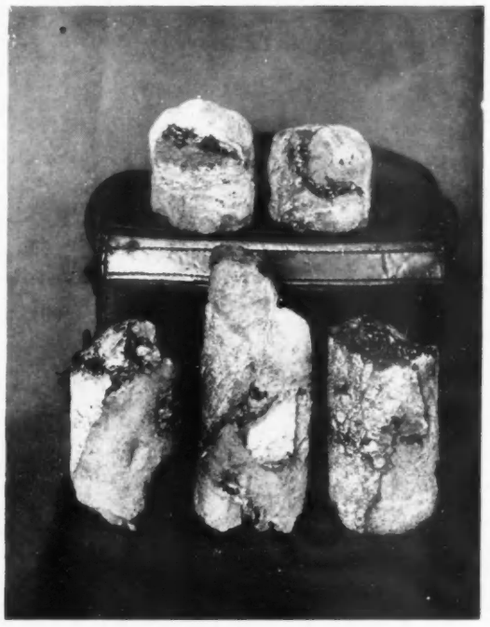


Fig. 12. Cores taken from injected lewis holes. Note the traces of bitumen derived from the sealing of the vertical joints.

narrower than at Marseilles (the mean width being 4 inches and minimum one inch, compared with 12 inches) and, for another thing, the variation in their width was irregular by reason of offsets occurring at each course, which did not occur at Marseilles in a wall built within caissons.

In addition, the wash of the sea made it very difficult to stop the joints on the outer face.

The solution adopted consisted in the drilling, near the outer and inner edges of the joints, of 4-inch diameter holes, into which was injected a special emulsion of bitumen mixed with a filler (this was, in fact, 2 parts of cement to one part of bitumen), which formed a semi-plastic precipitate, serving somewhat the same purpose as sealing wax, behind whose protection it was possible to carry on the cement injection under low pressure by ordinary processes. (See Fig. 11). Special measures were taken in the case of the lewis holes in that part of the jetty (between 290 and 430 metres) where they had been only partially filled with shingle, in view of the intention to remove the blocks eventually by floating crane. Here, after removal of the shingle, the holes were refilled by the simultaneous injection in equal parts of ¾-inch aggregate and 1 to 1 cement mortar, forming an excellent and inexpensive concrete.

Cores extracted subsequently have shown the effectiveness of these methods and the density of the concrete obtained. (See Fig. 12).

These works were executed by the François Cementation Company of Paris, now the "Travaux Souterrains," who have now patented this method of sealing the vertical joints.

In reality, the programme outlined above applied essentially to the first branch of the jetty. In the case of the second branch, in which the lewis-holes had been completely filled with reinforced concrete, from the 900-metre point onwards, it was only intended to stop the vertical joints, which would, in conjunction with the interlocking of adjacent columns of block-

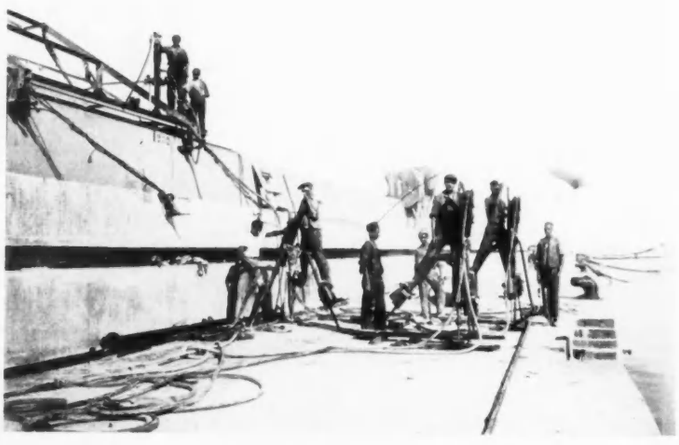


Fig. 11. Pneumatic Drilling at 280 metres. On the left, at the top of the parapet, drilling an injection hole for stopping a vertical joint on the seaward side. Centrally and on the right, three holes being drilled for injection in the lewis holes. Compare this view with Fig. 9.

Port of Algiers—continued

Fig. 13. Blows through interior vertical joints of the Jetty before injection.

work, suffice to suppress currents of water between them and the blows resulting therefrom. (See Fig. 13).

These works, which it was not purposed to undertake until 1934, when the structure would have taken its final settlement, between 900 and 1,200 metres, were the only works remaining to be done when, on 3rd February, 1934, a hurricane of absolutely extraordinary violence literally engulfed 400 metres of the structure, between 800 and 1,200 metres, leaving no trace of its existence but a solitary witness at its extremity in the shape of a shattered roundhead.

II—The Storm of 3rd February, 1934

Differing from those of 1930 and 1931, the very violent storm which raged in the Algiers roads from the 2nd to 7th February, 1934, was characterised by an almost entire absence of local wind. A deep cyclonic depression remaining stationary over Sardinia developed very strong and tempestuous winds on the line Genoa-Algiers, a line in whose direction the "fetch" is at a maximum and extends to 535 miles; but these winds ceased, according to the evidence of navigators, at about 30 kilometres or 19 miles out from Algiers. In fact, the surface of the sea remained smooth at Algiers, although it is usually very rough there in stormy weather. (See Fig. 14).

The progress of the storm was extremely rapid, since the sea, which was still calm on Thursday, 1st February, and only in slight movement at dawn on Friday, 2nd, was very rough in the afternoon of the 2nd, and absolutely furious in the morning of the 3rd.

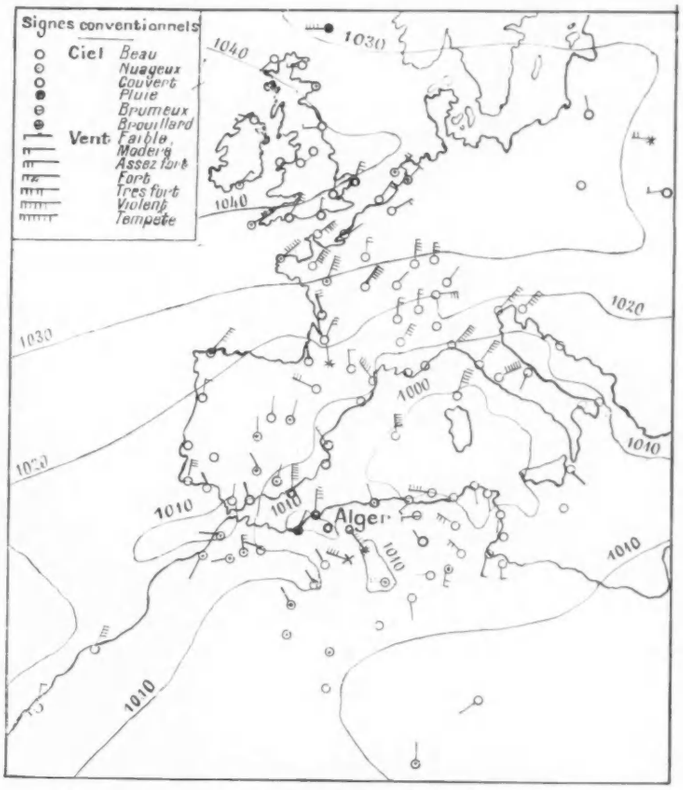


Fig. 14. Barometric Chart.

The swell, whose direction was N.E. ¼ N., consequently attacked the second arm of the Mustapha Jetty in a direction approximately normal or at right angles to its alignment.

Authentic and accurate evidence upon the actual circumstances of the disaster is abundant, by reason of the facts, firstly, that the destruction took place just at the time of resumption of duty by the engineers, foremen and workmen of the port extension works and, secondly, that a ship was alongside the second arm of the jetty ready to leave the harbour at the very moment of the catastrophe, which moreover put the ship in great danger through the sudden inrush of the seas on its beam. After this even the mail boats remained in port.

The observations made were as follows:—

The second arm of the jetty, which in the early morning (i.e., about 6.20) suffered only a slight settlement between 700 and 1,200 metres, with a maximum at 1,000 metres amounting to half a metre, collapsed like a house of cards about 6.45, after being topped by an enormous wave which rode over it in one sweep throughout its whole length.

The structure appeared to suffer the passage of this gigantic roller without weakening, but then seemed, as it were, to hesitate and suddenly broke up, as if it were sinking into itself, or as if the receding wave were sucking it out to sea. According to some of the sailors, they could still see the jetty walls, leaning heavily seaward, in the trough of the next wave; so that the total destruction of the work was brought about by two waves and not by one.

In that part of the structure which remained standing, the following damage was observed:—

Fracture of the wall about the 700-metre point, where the vertical section joins the rubble mound section, at the place where the waves began to break upon the slope of artificial blocks:

General sliding, one metre outwards, of the apron blocks at the foot of the wall between 700 and 750 metres;

General extensive settlement, and progressive sliding in towards the harbour of the outer end of the portion of jetty left standing, from point 717 to 799 where the breach began: (See fig. 15).

Vertical longitudinal fracture of blocks of the second course from point 730 to 764.

Opening of the construction joints spaced at every 12 metres in the capping wall and breakage of the 1¼-inch round bars which dowelled this wall longitudinally.

As to the destroyed part of the second arm, soundings and partial surveys by diver revealed an almost incredible confusion—foundation rubble and wall blocks jumbled together—and confirmed that the jetty walls had fallen sharply outwards and broken up in falling, except at the two ends of the breach (from chainage points 800 to 840 metres and 1,140 to 1,200 metres) where the walls were progressively dislocated and overturned towards the harbour.

Thanks to the dowels of reinforced concrete connecting together the blocks in each group or column, no sliding movements of blocks, such as occurred at Catania in 1930 and 1933, were anywhere observed.

The continuous breaking of waves over the jetty after its overthrow scoured out the materials in the rear, hollowing in the foundation rubble a cavity dropping in places as low as 18 metres below zero of charts, or 3 metres below the foundation level of 15 metres.

Yet photographs show conclusively that notwithstanding its exceptional amplitude the swell did not break in depths of 20 metres outside the jetty but only in depths of about 9 metres. (See Fig. 16).

This point is considered very important, since certain authors profess to have seen breakers in much greater depths. It may be questioned whether such breaking, far from being true breaking due to reduction of depth, be not rather only the apparent breaking due to the violent winds that usually accompany great storms, and which easily sweep off the crests of waves, as soon as these tend to sharpen by reason of decreasing depth.

The absence of wind during the great storm of 3rd February gave opportunity for observation free from this usual accompaniment, and the fact calls for emphasis.

Observations made during the height of the storm were as follows:—

The period of the waves, true constant of a swell, was 13¾ seconds, an altogether exceptional figure, at least in the Mediterranean, and one which can only be compared with that of 12 seconds observed at Catania during the storm of 26th March, 1933, which carried away, for a length of 700 metres, the vertical-faced breakwater which had just been completed at

Port of Algiers—continued

Fig. 15. Second Arm of the Mustapha Jetty after the accident. View taken from metre-point 700. Note the sliding and sinking of the part left standing. In the distance the broken roundhead, of which only a small part emerges. On the right a bundle of 2¾-in. round bars, bent like a skein round a bollard by the violence of the storm.

that port. Standard formulæ enable one to calculate from this time-factor the wave-length in deep water*, thus:—

$$2\,L = \frac{2g}{\pi}\,T^2 = 300 \text{ metres}$$

which is a figure never before observed, to our knowledge, in the Mediterranean, and which accounts, moreover, for the fact that even at the height of the storm ships of small dimensions were able without difficulty to enter the Port of Algiers.

The length of the swell in the neighbourhood of the breakwater was reckoned by counting the number of wave crests between the North Jetty and the Mustapha Jetty. The distance between these two works being about 1,200 metres and the number of waves having been 5 or 6, gives a length of the order of 200 metres, which agrees closely—for depth between 20 and 35 metres—with the formula:—

$$2\,T = \sqrt{\frac{\pi}{g}\,L \cot.\frac{\pi}{L}\,H}$$

The measurement of the height of waves is a much more difficult matter. It could only be done by noting, during a period of about 10 minutes, the movements of the 11-cubic-metre light-buoy, which is moored at 400 metres beyond the round-head of the North Jetty, in relation to the horizontal line of a fixed telescope of high magnification, and on comparing these movements with a dimensioned sketch of the buoy it was computed that, at 9.30 a.m. on 3rd February, 2 h = 7 metres.

This figure, however, certainly represents a minimum, for this reason:—

Fig. 16. View of a wave sweeping over the second arm of the Mustapha Jetty, between 675 and 800 metres. On the left, the wave is breaking on the artificial blocks of the protective bank, which stops at 690 metres. On the right, the wave at its highest. Note the absence of white breaking crest. The wave coming from N.N.E. is slightly inclined to the structure and has already passed over the parapet at 700 metres at the moment that it attains its maximum height at 775 metres.

* Off Algiers a depth of 2,000 metres is reached at less than 10 miles out. It is this great depth so near to land which accounts for the extraordinary violence of storms on this coast.

The buoy in rising with the lifting wave is retarded by the weight of its chain when the wave is at its height, the buoy is more deeply immersed than in calm water, its rising momentum is not checked instantaneously and it would even tend to rise higher if the dropping of the wave level at this moment did not occasion a drag in the opposite sense. Then, nevertheless, there occurs a lag which prevents the buoy from following the descending wave and leaves it in balance just at the moment when the trough of the wave, having dropped below mean water level, rises again, passes the normal line of flotation of the buoy and submerges it.

From experiments made and measurements taken, it appears reasonable to allow for an error of 10 per cent. on the rising and 10 per cent. on the falling movement, giving 7 metres × (1 + 20 per cent.) = 8.4 metres as the mean amplitude of the swell.

This conclusion is corroborated by examination of photographs taken of the sea outside the first branch of the Mustapha Jetty, which show waves of about 16 metres from trough to crest corresponding to 8 metres amplitude of the approaching swell. Now, this figure must certainly have been exceeded, because there was only a very partial reflection of waves on the first branch of the Mustapha Jetty.

The wave observed sweeping over the first branch at the 200-metre point, moreover, was about 4½ metres high, and the photograph reproduced in Fig. 18 shows a wave sweeping over the second branch at a height of 6 metres.

It will be seen later that such observations as these confirm that the height of waves approaching was of the order of 9 metres, an amplitude never known before, all the literature of the subject having given as the maximum recorded in exceptional Mediterranean storms the wave-height of 6 metres experienced notably at Genoa, which had until recent years the reputation of being one of the most exposed ports in the Mediterranean.

Fig. 18. View of the Mustapha Basin during the storm.

Now, on the 30th December, 1933, the breakwater had had to bear the attack of a storm, fortunately of short duration, in the course of which waves of 1½ to 2 metres in depth had been observed to sweep over the second arm just about the 1,000-metre point.

The theory of the "clapotis" or standing wave enables one to deduce from that observation the amplitude of the approaching swell, if one allows—as is often done—that the wave-length would be about 15 times the height, thus:—

$$2\,L = 15 \times 6 \text{ metres} = 90 \text{ metres.}$$

Under that attack the structure had suffered no damage—merely a little scouring down of the top of the rubble mound foundation had been observed, and this was fully made good by 30th January, 1934.

The state of affairs was therefore that the Mustapha Jetty had given proof of its stability under storm conditions equal to those for which it was designed in accordance with the best information then available upon the violence of the sea to be expected at Algiers. (See M. Quellenec's Report to the 14th Navigation Congress).

The very serious accident of 3rd February, 1934, therefore points to the conclusion that vertical-faced breakwater walls—at least in their usual form—are unable to withstand the severest storms. Before definitely admitting such a conclusion, however, it seemed to the Author essential to undertake further examination of the capacity of resistance of such structures, also an exhaustive investigation of the circumstances attending the disaster, with the object of ascertaining:—

Firstly, what improvements ought to be made in the types and methods of construction followed hitherto, and of which the Mustapha Jetty was regarded as one of the best examples; and

Secondly, what are the limits that should be set for the employment of block walls and in what circumstances the older type of sloping rubble mound breakwater is preferable.

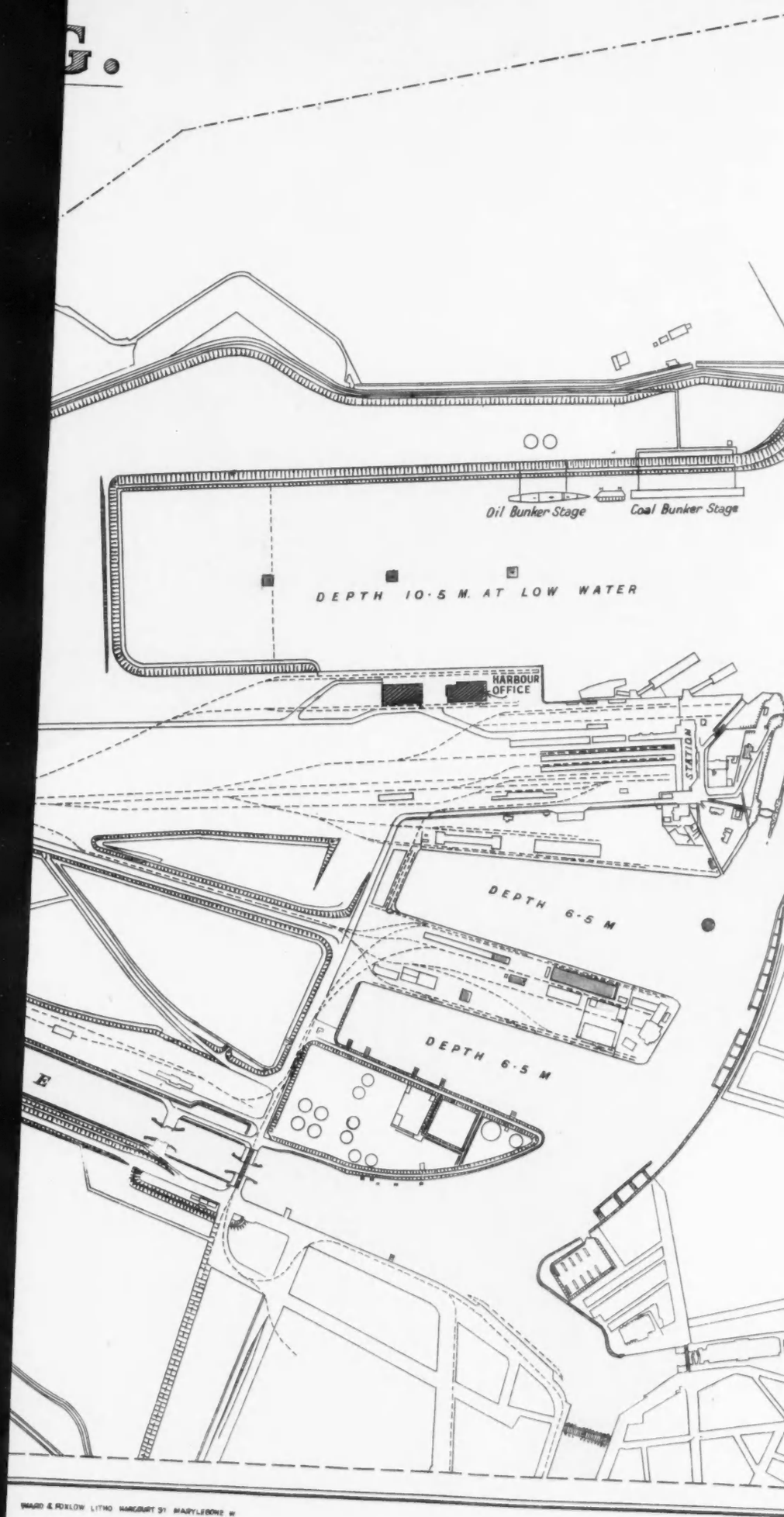
These questions will be reviewed in a second article.

PORT OF FLUSHING.

UNDER THE JURISDICTION OF THE N.V. HAVEN VAN VLISSINGEN.

AND HARBOUR AUTHORITY. FEBRUARY, 1936.

G.



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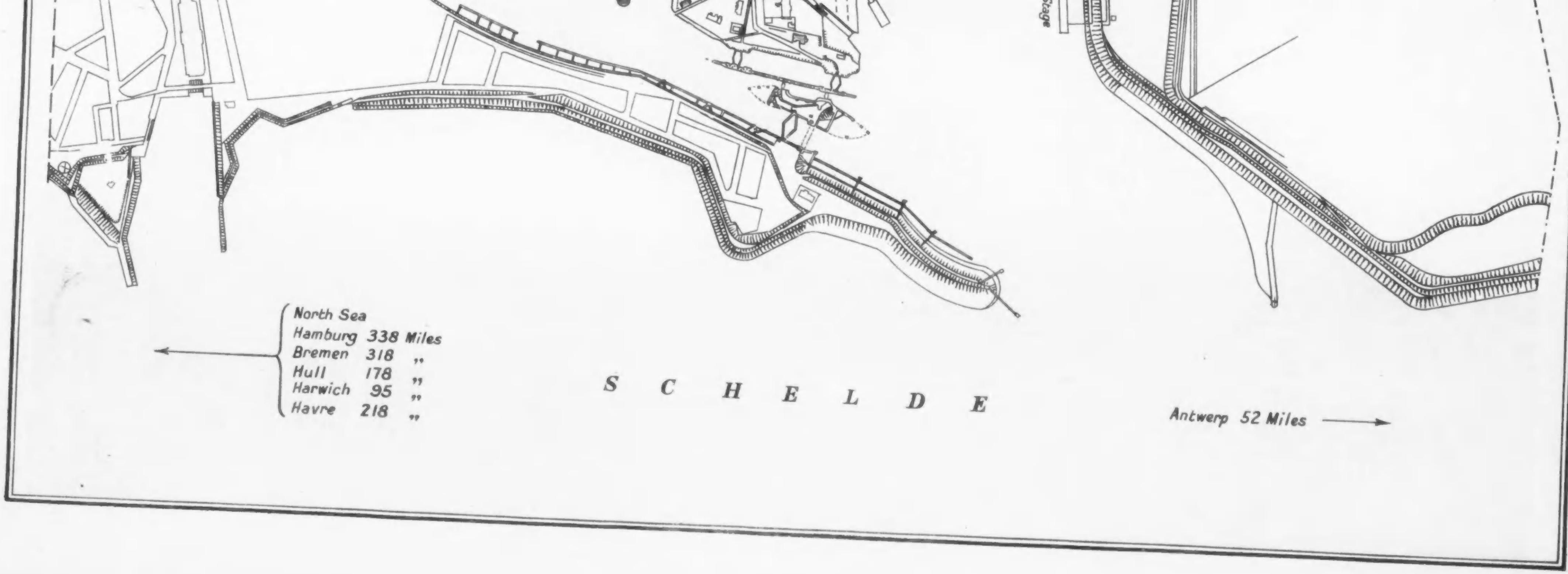
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North Sea
Hamburg 338 Miles
Bremen 318 "
Hull 178 "
Harwich 95 "
Havre 218 "
S C H E L D E
Antwerp 52 Miles

Port of Flushing, Holland

Aerial View of the Port of Flushing, showing the Inner Port on the left and the New Outer Port on the right.

View of the Outer Port, Port of Flushing.

The Port of Flushing, Holland

The "Ubena" of the Woermann Line (Hamburg) alongside the Quay in the Outer Port.

History.

FLUSHING, which is situated at the mouth of the River Schelde, provides a safe shelter for vessels in the roads, where, since times immemorable, vessels have always found a safe anchorage.

The Vikings made Flushing a regular port of call on their expeditions to the South, and about the year 1200 Flushing had the doubtful pleasure of their visits on several occasions. A number of Vikings remained behind on the Island of Walcheren, and a little village in the neighbourhood of Flushing, known as Westkapelle, is even to-day mainly populated with the descendants of these Norsemen, who have their own customs which set them apart from the other inhabitants.

By the end of the 13th century it had become clear that the increase in traffic necessitated the construction of a port, and in 1308, during the reign of Count William III., the existing shelter was enlarged and improved by the construction of a port which had to be completely excavated. In 1315 Flushing received the privilege of a city. With the completion of the port trade still further developed, especially with England and as early as 1380 coal was regularly imported from England. From this period continual improvements were made to the Port of Flushing, and at the end of the 16th century, a time of great prosperity, the sailing ships would set out from Flushing trading with many parts of the world, and also took an active part in the development of the West Indies and the Guineas. About this time the House of Orange, which is still the reigning House of Holland, acquired Flushing and Veere and contributed considerably towards their welfare.

Construction of the New Outer Port (1923-1931).

Although Flushing could accommodate a great many sailing vessels the arrival of steamers found her unprepared to meet the demands required for greater depth and longer quays to accommodate the steamship. In these years Rotterdam, Antwerp, Ghent and Amsterdam expanded, and also gradually attracted the traffic, which Flushing, by her geographical and natural advantages, could have handled as well, or even better, if only her port had kept pace with the ever-increasing size of the steamships.

After the Great War, however, it was decided not to abandon the most southern port of the Netherlands, but to construct a new basin connected directly with the Schelde, so that ships could enter the port without losing any time by having to pass through the locks to the inner harbour. The construction of this basin was commenced in 1923 and completed in 1931, when it was officially opened by Queen Wilhelmina.

Although the difference between high and low tide is about 14 ft., even the largest vessels can enter at all times, as the depth at mean low tide is 34 ft. The entrance, which is about 1,200 ft. wide, faces south, and as the most dangerous storms come from the north-west, it is always possible to enter the port in perfect safety. The Zeeland Steamship Company maintains a daily service from and to Harwich, and it is the pride of the Company that they have never suspended the service on account of weather conditions. Even in heavy fog ships can enter, guided by a special signal system.

A number of pontoons, which fall and rise with the tide, offer berthage for the ferry boats to the mainland and also for the boats to England. For the accommodation of the larger ocean-going vessels a quay 1,200 ft. long is reserved. The oil and coal bunker stations are situated on pontoons and have a length of over 1,250 ft. Some up-to-date warehouses have also been built, and further equipment will be added for the purpose of giving as quick a turn-round as possible to vessels. The water surface of the outer port is over 40 acres.

Inner Port.

The inner port has a water surface of 20 acres, and has available 6,000 ft. of quayage with a depth of 21 ft.

Port Management.

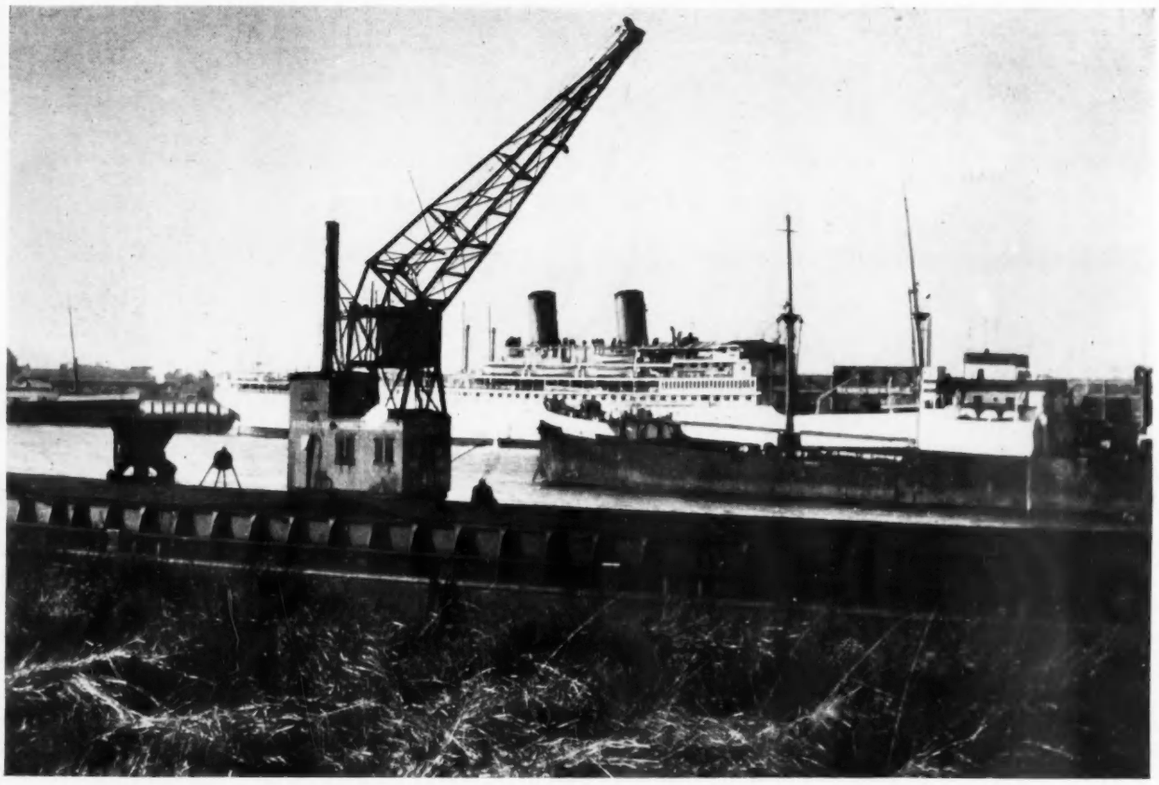
The inner port was managed by the City of Flushing on rather modest lines, and when the outer port, which was constructed by the Government, was completed it was considered advisable to turn this over to the City as well, as it did not seem practicable to have separate managements for the outer and inner ports. This, however, threatened to become a great financial burden for the city owing to the fact that considerable capital was required to provide the necessary modern equipment, sheds, etc., and it was therefore decided to form a limited company, the N. V. Haven van Vlissingen, with a capital of 1,000,000 guilders, one-third of which was subscribed by the Government, one-third by the City of Flushing, and the remaining third by private capital. The Articles of the Company were passed in June, 1934.

The Company rented the port, the adjoining land and all existing equipment and warehouses from the Government for a period of 75 years on very favourable terms. This arrangement has many advantages, as all matters pertaining to the port are under one management except for the pilot dues, which are charged and collected by the Government and which are the same for all Dutch waterways and ports. All other charges, such as harbour dues, quay dues, wharfage and also stevedoring and storage are fixed by the Company. This guarantees quick and conclusive bargaining for the use of the port.

The work and duty of the Company is a dual one. The first is the administration of the port and giving opportunities to firms to carry on their work advantageously. Everything is done to attract as many interests as possible to Flushing, and while monopolies are not given, unnecessary competition in one branch causing loss to interested parties is avoided. The Government has reserved the right to protect the interests of the public in general by fixing maximum dues which may be collected for the use of the port.

The second position which the Company fills is as stevedore and warehousing Company. Again, in this instance, no monopolies are exercised, but it is the Company's intention to follow its present policy of dividing the work among the interested parties in such a manner that the largest and cheapest turnover for the port will be obtained.

Port of Flushing, Holland



The "Nieuw Zeeland" of the Kon Paketvaart of the Dutch East Indies landing Passengers.

Coal Bunkering at the Establishment of the Coal Trading Association.

Port of Flushing—continued

The principal article of transhipment in the port is coal, and this is handled by the Coal Trading Association of Rotterdam, who have the most up-to-date cranes and machinery for this purpose. The Vlissinsche Mineraal-olie en Asphalt Raffinadery, of Flushing, has an establishment with a capacity of over 50,000 tons for the storage of oil, etc.

The hinterland of the port is limited, as both Antwerp and Rotterdam cover the principal part of it, and the connection with the Rhine is not so favourable to Flushing as compared with Rotterdam. The strength of Flushing lies in its direct proximity to the steamship lanes on the North Sea and its position at the mouth of the Schelde in relation to Antwerp; the easy navigability and approach to the port and the fast railway connections with Germany, etc.; also recently the air service which is established next to the port. These several advantages have already attracted a considerable amount of traffic to the port, which seems to justify the enlargement of the outer port.

Before the official opening of the outer port in 1931, the Coal Trading Association of Rotterdam had established a small coal-bunkering station, which from year to year has expanded until to-day it handles as many as 100 sea-going vessels a month.

In 1934, 867 vessels aggregating 1,579,857 n.r.t. called at Flushing to obtain bunker coal, a number which has increased in 1935. Soon after the Harbour Company undertook the management of the port, a contract was signed with the Vlissinsche Mineraal-olie en Asphalt Raffinadery, which operates a refinery in the inner port, to build an installation in the outer port for the storage and transhipment of oil, molasses, etc. At the present time this Company have constructed eleven storage tanks with a capacity of 42,000 tons, and a tank ship has been purchased which can store 8,000 tons of oil and also deliver overside to vessels requiring this commodity. Two powerful pumps have also been installed ashore, in order to be able to supply oil simultaneously to more than one ship. The berthing facilities for the delivery of oil have been extended over a length of 1,250 ft.

The immediate success obtained by the Coal Trading Association has helped enormously in equipping the port for the reception and handling of vessels. A bonded warehouse with a capacity of 8,000 tons is provided for goods in transit.

As far as attracting other traffic is concerned, world conditions have not helped very much towards a rapid and favourable development, and the fact that the Dutch Government decided to remain on the gold standard placed Dutch business interests for the time being in an unfavourable and sometimes difficult position in competition with other countries.

The N. V. Haven van Vlissingen has developed the Port of Flushing slowly, but at the same time the Company is, when necessity arises, purchasing modern machinery and cranes to keep up to date and to enable a quick turn-round of vessels. There are 40 acres of land available for the erection of warehouses and for extension purposes at such time as the necessity arises for future development.

Unloading Macadam by means of Conveyors.

At the present time the port has available one crane of 30 tons, four cranes of 6 tons, six floating cranes of 5 to 10 tons, and five portable conveyors.

As the N. V. Haven van Vlissingen has been working only a relatively short time no statistics are available for the purpose of comparison, but during the year 1935 between 450,000 to 500,000 tons of goods were handled consisting mainly of coal and oil, general cargo for England, building materials, fertilisers, etc.

The number of vessels calling at Flushing during the year 1934 was 1,825 vessels of 2,124,760 n.r.t.

Lloyd's Register Shipbuilding Returns for the Quarter ended 31st December, 1935

The statistics issued by Lloyd's Register of Shipping regarding Merchant Vessels under construction at the end of December last show that in Great Britain and Ireland there is an increase of 212,532 tons in the work in hand, as compared with the figures for the previous quarter. The present total of tonnage under construction—743,086 tons—is 146,252 tons more than the tonnage which was being built at the end of December, 1934, and is the highest quarterly total recorded since December, 1930. Moreover, it exceeds the aggregate tonnage now under construction in the seven leading countries abroad.

The tonnage on which work was suspended at the end of December last amounted to 14,288 tons, being composed entirely of steamers.

About 122,000 tons—16.4 per cent. of the tonnage now being built in this country—are intended for registration abroad or for sale.

The tonnage now under construction Abroad*—800,067 tons—is about 133,000 tons more than the work which was in hand at the end of September last. Tonnage, included in the total in hand abroad, on which work has been suspended, amounts to 5,050 tons of steamers and 5,975 tons of motor-ships

The leading countries abroad are:—Germany, 254,121 tons; Japan, 118,610 tons; Holland, 104,325 tons; Sweden, 94,802 tons; Denmark, 61,085 tons; and France, 56,078 tons.

The total tonnage under construction in the World* amounts to 1,543,153 tons, of which 48.2 per cent. is being built in Great Britain and Ireland, and 51.8 per cent. abroad. The quarterly total for the world shows an increase of 345,184 tons over the figures at the end of September last, and is the highest recorded since June, 1931.

In Great Britain and Ireland, 311,100 tons were commenced during the last three months, an increase of 191,121 tons, compared with the corresponding total for the September quarter. During the quarter ended December, 1935, 132,139 tons were launched in Great Britain and Ireland, an increase of 19,299 tons as compared with the previous quarter. Similar figures for abroad are 276,112 tons commenced, and 226,397 tons launched, showing, as compared with the previous quarter, increases of 90,260 tons in the tonnage commenced, and of 75,770 tons in the tonnage launched.

Steam and motor oil tankers under construction in the world amount to 59 vessels of 438,560 tons, of which 15 vessels of 114,040 tons are being built in Great Britain and Ireland, 11 vessels of 101,700 tons in Germany, 6 vessels of 52,264 tons in Sweden, 10 vessels of 47,835 tons in Holland, 4 of 29,665 tons in Japan, 4 of 28,200 tons in the United States of America, 3 of 25,200 tons in Denmark, and 2 of 16,736 tons in France.

Of the 743,086 tons under construction in Great Britain and Ireland at the end of December, 376,714 tons consisted of motor-ships, while at the same date the motor-ship tonnage being constructed abroad (520,822 tons) was 244,978 tons in excess of that of the steamers.

The vessels being built in the world at the end of December include 1 steamer and 24 motor-ships of between 8,000 and 10,000 tons each; 8 steamers and 20 motor-ships of between 10,000 and 20,000 tons; 1 steamer and 2 motor-ships of between 20,000 and 30,000 tons; and 2 steamers exceeding 30,000 tons each.

The table respecting marine engines shows that the horse-power of steam engines now being built or being fitted on board amounts to about 587,000 h.p.; this figure includes 49 sets of turbine engines of about 363,000 shaft horse-power. The horse-power of the steam reciprocating engines (about 225,000 h.p.) amounts to 15.7 per cent. of the total horse-power of marine engines now being built in the world. The figures for oil engines aggregate approximately 840,000 h.p.

Tonnage to Lloyd's Register Class.—Of the merchant shipbuilding in hand throughout the world at the end of December, 1,090,600 tons, or over 71 per cent., are being built under the inspection of Lloyd's Register. Of this total, 670,232 tons, representing more than 90 per cent. of the tonnage being built there, are under construction in Great Britain and Ireland; while, of the tonnage being built abroad, 429,368 tons, or 53.7 per cent., are being constructed under the inspection of Lloyd's Register.

*Excluding Russia, for which no figures are available.

Notes from the North

Drainage of a River.

MR. H. L. BUNTING, Deputy Borough Engineer, Southport, in an address to a local engineering society, explained the system of drainage of the River Crossens Catchment Area.

He said work was started in June, 1933, with dragline machines on the length of sea channel between the Cylinder Bridge and the New Cut. The method adopted in carrying out the dredging was for one machine to work on each bank, one working upstream and the other downstream. The excavated spoil was deposited on each bank, being prevented from running back into the channel, under the action of high tides, by means of small turf retaining banks built up by the machines before the excavation started. The excavation spoil was left to dry out and then levelled down to a height not exceeding 3 ft. Pit-props, 9 ft. in length and about 1 ft. apart, were driven near the foot of each bank along certain sections of the excavated channel, particularly at bends, in order to prevent the bank slipping by the action of high tides. Steel sheet piling was driven along the northerly side of the channel immediately seaward of the Cylinder Bridge to replace the old stone revetment walls that had been taken out. This piling at intervals was also used along the southerly bank to support the existing stone walling.

Each dragline machine towed behind it a steel ramp, and during high spring tides the machines travelled up these ramps so as to protect the engine from damage by sea-water.

This section of the channel had been completed, and as the necessary capacity has been provided in this length of the channel, it has been thought advisable to leave the "New Cut" until later and to deal with the inland rivers.

Liverpool's Better Traffic.

A sure sign of better trade at Liverpool docks is provided by the traffic returns of the Liverpool Overhead Railway. In the first few days of January there was an increase of ten per cent. over the corresponding period of last year.

Mr. Box, Manager of the Overhead Railway, states the chief reason for the better traffics must be that there is a good deal more work going on at the docks. Recently, they had carried over 5,000 workmen each day, a figure they had not reached since 1932. When workmen's traffics increased, the ordinary traffics rose accordingly.

New Coaling Plant.

The London, Midland and Scottish Railway Company has just erected the first of six new coaling plants which form part of an £85,000 improvement scheme at Fleetwood Harbour. These six electrically-operated belt conveyors, capable of dealing with 20-ton wagons, will replace the present system of bunkering trawlers by means of cranes and buckets. Following the introduction of the new appliances, the L.M.S. will take over the whole of the work in connection with coal shipping, including trimming.

New Dredger for Isle of Man.

Isle of Man Harbour Board is having built a new dredger, the "Mannin," at Glasgow. The order was placed at the end of the season with Messrs. Priestman Bros., of Hull, for a grab hopper type of vessel. While Priestman's are specialists in this type of craft, they are not the actual shipbuilders, and the hull has been built by Messrs. Lobnitz, of Glasgow. The new craft, with all the necessary accessories, will cost several thousands of pounds, and Tynwald this year voted £8,000 for the purpose.

New Grain Silo.

Liverpool Grain Storage and Transit Co., Ltd., are erecting a new reinforced concrete grain silo of 60,000 tons capacity at the Brunswick Dock, Liverpool.

So far, one section only of the building has been completed; another similar one will follow, and between them will be a working tower to feed the grain into the bins. So far, 141 grain silo bins, each 116 ft. deep and with inside measurements of 10 ft. 6 in. by 8 ft. 6 in., have been moulded into shape.

Mr. W. L. Philip, of Corsham, is the consulting engineer.

Two shifts of 170 workmen each are employed day and night, for the lifting jacks operating the forms could not be allowed to stop, otherwise the concrete would reveal joints.

The contractors for the foundations and the building are William Thornton and Sons, Ltd., of Liverpool, and they have used approximately 535 tons of reinforced steel, 11,000 tons of crushed granite, and 2,150 tons of cement in the construction of this first section. The central working tower will be 235 feet high, and it will be equipped with the most up-to-date plant.

Maryport Harbour.

In the recent storm much damage was done to Maryport Harbour. The quays and two sea walls were damaged and a 50 yards' length of the south pier was swept away, and it is hinted that the cost of reconditioning will run to five figures. Recently the Commissioner for Special Areas made a grant of £4,000 for dredging. The harbour authorities are in touch with the Commissioner in the hope that some further Government aid may be obtained.

Manchester Ship Canal Company and Runcorn Venture.

Runcorn Urban Council has informed the Manchester Ship Canal Company that it is agreeable to waive the Company's obligation to construct a wet dock at Runcorn, subject to such an agreement as may be considered necessary by the Council's solicitor. The communication was the result of a letter received from the Ship Canal Company, in which the Company intimated that they had under consideration a scheme for the establishment of certain works at Runcorn that would be of benefit to the town. The proposal was subject to the Council agreeing to waive the obligation contained in an agreement with the Council, to the effect that the Company construct a wet dock at Runcorn.

Wallasey Pier Works.

Wallasey Corporation received nine tenders for the repair and reconstruction work required to be done at the new Brighton ferry pier during this and the two following winters. Messrs. Francis Morton and Co., Ltd., Liverpool, who quoted £29,615, have been allotted the contract. The tender is conditional upon the ferry being opened for traffic while the repair work is being done. If the Council reaffirm their decision and the ferry remains closed during the winter months while the work is proceeding, the tender will, it is stated, be reduced by about £600.

Fifty Year Old Dredger Scrapped.

Preston Corporation dredger "Preston," which for the greater part of fifty years has scooped sand and gravel from the bed of the Ribble, is now inadequate for work in the Ribble and is to be broken up.

She is one of three dredgers, each of which cost about £20,000, built to the order of the Corporation. Only one is still in use—the "Walter Bibby." The other one, the "Gilbertson," named after a former alderman of the town, was sold some years ago to the Workington Harbour Board. The "Preston" could dredge practically 50 ft. below waterline. She will not be replaced, as one dredger is now considered sufficient.

Whitehaven Harbour Works.

Mr. P. Malcolm Stewart, Commissioner for Special Areas, has approved a scheme for improving Whitehaven Harbour. A grant of one-third and a loan of two-thirds of the cost—which cannot be indicated until the contracts have been let—will be made. The harbour entrance is to be enlarged to enable ships of 2,000 tons to be berthed, and it is expected that the scheme will give employment to 100 men for six months.

Whitehaven Harbour Commissioners have approved the scheme and accepted the terms.

The scheme is to widen the entrance to the dock on the sill, to remove the present dock gates and replace them with new ones electrically operated; to repair a leak of water, and to shorten a bulwark so as to enable long vessels to make the entrance to the dock more easily.

Death of former Dock Manager.

Mr. Miles Kirk Burton, a former general manager of the Mersey Docks and Harbour Board, died recently, at Bath, at the age of 93 years.

Starting his business career in the warehousing department under the Dock Committee some months prior to the establishment of the Mersey Docks and Harbour Board, he was transferred to the secretary's office, and in 1875 was made assistant-secretary, and in that capacity, and, later, as secretary and general manager, he had an official hand in all the great developments of the port up to the time of his retirement in October, 1912. He become general manager in 1894. At this time there was a great deal of talk about the possible effects of the Manchester Ship Canal on the trade of the port. So far from Liverpool suffering from the canal, the amount of her tonnage continued to grow, and Mr. Burton lived to see it reach very large proportions, compared with those of the early years.

Portable Conveyors with Adjustable Discharge Level

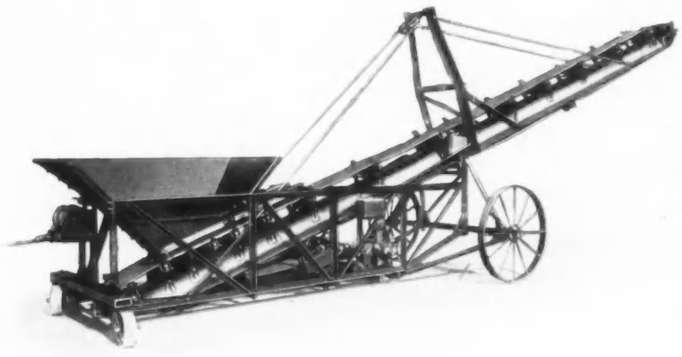


Fig. 1. Conveyor with hinged boom in extreme "up" working position.

ONE of the most economical methods of handling bulk materials of all sorts is to use portable belt conveyors, which are met with in almost every type of plant where coal, coke, sand, crushed stone, gravel, ashes and so on are dealt with. The outstanding advantages of the portable conveyor lies, of course, in its adaptability for a large number of different services, and its utility is greatly increased if it is possible to make some adjustment to the slope to suit varying discharge levels. In the standard types manufactured by Fraser and Chalmers Engineering Works (Proprietors: The General Electric Co., Ltd.), in association with the Robins Conveying Belt Co., of New York, not only can the whole conveyor be tilted about the wheel base as required, but in addition a vertical adjustment is provided which enables the discharge end only to be raised or lowered through a range of 2 ft. 6 ins.

However, there are many conditions which require a much larger variation of the discharge end only. Common examples are the loading of barges and lighters from the side of a wharf where tidal conditions prevail and the loading of railway trucks, wagons, and lorries where it is important to avoid risk of breakage of material. This problem has been solved by the development at Fraser and Chalmers Engineering Works of a new type of portable conveyor whose forward end is arranged as a hinged boom. Not only can this boom be raised or lowered according to tidal or other conditions (Figs. 1 and 2) but it can also be hoisted into a vertical position (Fig. 3), enabling passing traffic, ship's rigging, etc., to be cleared without having to turn the whole machine out of the way and also facilitating manœuvring into position on congested sites. It will be seen that this conveyor, though primarily designed for ship-loading purposes, has also many advantages in industrial applications where the material has to be trimmed to varying heights.

The whole conveyor is designed for operation, traversing, and manœuvring with the least possible effort. At the front end is the hinged boom arranged in triangular form with a fixed back frame normal to the boom and two adjustable wire-rope stays. A steel wire hoisting rope is reaved through a sheave mounted in a swivelling yoke-plate at the top bar of the fixed back frame; one end of the rope is anchored at the side of the feed hopper, while the other is carried under a fixed sheave at the opposite side of the hopper to a hand-operated worm-driven winch at the rear of the underframe. The extreme up and down working positions of the boom are shown in Figs. 1 and 2, while the vertical position is seen in Fig. 3.

The conveyor itself employs a rubber-covered troughed belt of the standard Robins type. The idler brackets and pulleys are carried on a main body, which (including the hinged part) is constructed of thin semi-tubular plate, jointed and stiffened; the head and tail belt pulleys are mounted on built-in supports at each end. The conveyor may be driven by either a petrol engine (as illustrated) or an electric motor, mounted on the side of the underframe. The drive is transmitted through two sets of bushed roller chains and sprockets to a snubbed pulley, fitted with a screw adjustment to enable the correct tension in the belt to be maintained throughout its working range. At the rear of the main underframe is the receiving hopper with the feed-on chute to the belt; the hopper can be made to any required size, shape or height to suit the method of feed employed.

The underframe carrying the whole machine is mounted on road wheels at the forward end and swivel castors at the rear. This allows the conveyor to be turned radially about the axis of the front wheels, enabling it to be moved laterally across a narrow road or dock wall and to be taken in and out of restricted spaces on congested sites, in railway sidings, etc.

Fig. 3. Conveyor with hinged boom raised to vertical position to clear passing traffic, ship's rigging, etc.

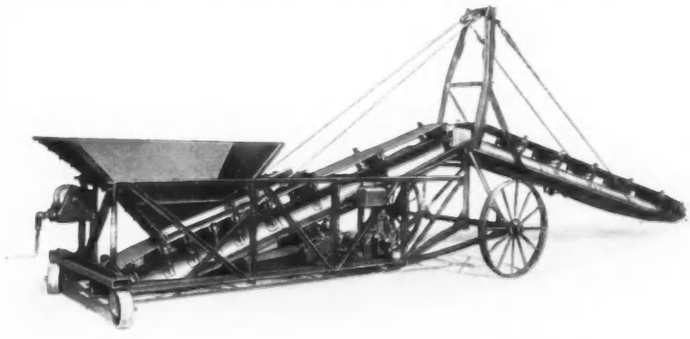


Fig. 2. Conveyor with hinged boom in extreme "down" working position.

Appointments.

The Anderson-Grice Co., Ltd., Taymouth Engineering Works, Carnoustie, Scotland, have appointed Mr. C. C. Richards, A. M. I. Mech. E., 113, Hampstead Way, Golders Green, London, N.W. (Tel.: Speedwell 2638), to represent their Crane interests in London and district, and Mr. K. J. Knowles, A. M. I. Mech. E., 18a, Rowan Avenue, Whalley Range, Manchester (Tel.: Chorlton 2463), to represent them in Manchester district as from 1st January.

Record Coal Shipments.

The L.N.E.R. report that record coal shipments were made at Blyth during the week ended December 21st. The total amount of coal shipped at the port was 155,481 tons, of which 135,339 tons were shipped from the L.N.E.R. Staiths. The previous record figure for the port was 153,401 tons during the week ended the 30th November, 1935, and for the L.N.E.R. Staiths 132,312 tons during the week ended the 10th November, 1933.

Launch of M.V. "Pomeroon"

MESSRS. FERGUSON BROTHERS (PORT-GLASGOW), LIMITED, launched on January 8th, the twin-screw Diesel engined cargo and passenger vessel "Pomeroon."

The "Pomeroon" has been constructed to the order of the Crown Agents for the Colonies for the Transport and Harbours Department of the British Guiana Railways and adds yet another vessel to the large number constructed by the builders, for the Crown Agents for the Colonies.

The vessel was launched almost complete with all machinery aboard and was christened by Mrs. Fleming, wife of Colonel John Gibson Fleming, C.B.E., D.S.O., Crown Agent.

The vessel is intended for general cargo and passenger service in British Guiana; 600 deck passengers can be carried, and the main deck has been specially designed and arranged for the carriage of motor cars, for the loading of which, sliding doors have been arranged in the bulwarks.

First class accommodation is arranged on the promenade deck, all the rooms being neatly and comfortably fitted up with a view to the hot climate.

A well-appointed saloon is arranged on the promenade deck, and a post office and bar on the main deck.

The deck auxiliaries include one Clarke, Chapman "Macfarlane" cargo winch, electrically-operated, and one electrically-operated windlass on forecastle head, and capstan aft.

The vessel is provided with a derrick, capable of lifting up to 5 tons and of handling the cargo from the main hold.

The main propelling engines were built by Messrs. Davey, Paxman and Co. (Colchester), Ltd., and consist of two Paxman-Ricardo Type 6RZ, marine Diesel engines, each having a continuous rating at site of 180 b.h.p., when running at a speed of 1,000 r.p.m., fitted with reverse and reduction gears, giving a propeller speed of approximately 300 r.p.m.

They are of the makers latest type with cylinders of 6¾ in. bore by 10 in. stroke, totally enclosed, with forced lubrication throughout and fitted with the patented Ricardo "Comet" head type of combustion chamber.

An outstanding feature of the design is the method by which the pistons are withdrawn. It is unnecessary to disturb the cylinder heads in any way, the pistons being withdrawn whole through the crankcase doors.

A single camshaft is employed from which the valves are operated by means of rocker levers and push rods; the valve gear being lubricated by means of a separate pump driven from the camshaft.

The fuel pump and equipment is of the C.A.V. Bosch type and is gear driven from the camshaft.

Provision is made for adjustment of the chain driving the camshaft and also for re-setting of the timing after such adjustment.

The speed of the engine is controlled by means of a hand throttle mounted in close proximity to the hand wheel controlling the reverse gear. Starting is by compressed air from receivers at 350 lbs. pressure.

Fresh water cooling is employed for the engines, being circulated by means of a pump driven from the main engines. This fresh water is in turn cooled by salt water which is circulated by means of a motor-driven pump through a tubular cooler fitted with cupro nickel tubes.

The auxiliary engines are also of the Paxman-Ricardo series consisting of a 3MRQ and a 4MRQ. The former has a continuous rating at site of 33 b.h.p. at 1,100 r.p.m. and the latter a rating of 47 b.h.p. at 1,100 r.p.m.

Each engine is direct coupled to a dynamo and drives an air compressor through a friction clutch, the whole being mounted on a common bedplate.

Like the main engines, these auxiliary engines and compressors are cooled by fresh water, the pumps on same being coupled to the main system.

Two Dawson and Downie electrically-driven general service pumps are fitted in engine room, also sanitary pump.

The shipbuilders' patent "Newark" oil retaining glands are fitted to stern tubes.

The vessel and machinery have been built under Lloyd's Special Survey and to their classification requirements, the Consulting Engineers and Naval Architects being Messrs. Flannery, Baggallay and Johnson, Ltd.

Among those present at the launch were: Colonel John Gibson Fleming, C.B.E., D.S.O., Harold Fortescue Flannery, M.B.E., B.A., and Major McPhail, representing Messrs. Davey, Paxman and Co., Ltd.

The Port of Halifax

Review of Port Traffic during the Month of October, 1935

During the month of October, 1935, the total number of vessels arriving and departing at the Port of Halifax, with comparative figures, is reported as follows:—1935—589, 1934—527, 1933—646.

The net registered tonnage is reported as follows:—1935—458,986, 1934—511,224, and 1933—769,083.

The number of vessels engaged in the Trans Oceanic Service arriving and departing during the month of October, 1935, with comparative figures, is reported as follows:—1935—134, 1934—146, and 1933—200.

The number of vessels engaged in the Coastwise trade, arriving and departing during the month of October, 1935, with comparative figures, is reported as follows:—1935—455, 1934—381, and 1933—446.

Since January 1st, 1935, the total number of vessels arriving and departing at the Port of Halifax, with comparative figures, is reported as follows:—1935—4,780, 1934—4,381, 1933—4,824.

Cargo Tonnage.

The total cargo tonnage handled inward and outward during the month of October, 1935, with comparative figures, is reported as follows:—1935—189,063, 1934—165,736, 1933—206,891, 1932—84,407.

Since January 1st, the total cargo tonnage handled inward and outward, with comparative figures, is reported as follows: 1935—1,810,177, 1934—1,744,800, 1933—1,397,053, and 1932—1,243,856.

Passengers and Mail.

The total number of passengers landed and embarked at the Port of Halifax during the month of October, 1935, with comparative figures, is reported as follows:—1935—540, 1934—662, 1933—1,010, and 1932—942.

Since January 1st the passenger traffic, with comparative figures, is reported as follows:—1935—19,267, 1934—23,082, 1933—29,120, and 1932—54,147.

The number of bags of mail handled during the month of October, 1935, with comparative figures, is reported as follows:—1935—452, 1934—922, 1933—248, and 1932—462.

Since January 1st the mail traffic, with comparative figures, is reported as follows:—1935—67,996, 1934—77,084, 1933—68,273, and 1932—72,586.

Caernarvon Harbour Trust

At a recent meeting of the Caernarvon Harbour Trust, the Chairman, Sir Williams H. Vincent, G. C. I. E., K. C. S. I., referred to the retirement of Capt. Richard Jones, the superintendent and harbourmaster. When Capt. Jones took over his present post the financial affairs of the Trust were in a very bad state. There was a great lack of adequate stores and equipment for the efficient working of the port. During the period he had served the Trust, Capt. Jones had changed all that. There was now an ample supply of buoys, cables and other necessary equipment. A new slipway had been made and the condition of the port greatly improved. Also, the Trust had a substantial sum to their credit. Owing to ill-health, Capt. Jones was unable to continue to serve in the office as superintendent, so it was proposed to retain his services in an advisory capacity. In this way he would be enabled to retain his connection with the Trust.

It was unanimously decided to ask Capt. Jones to remain in an advisory capacity at a fee of £100 per annum.

The Chairman reported that 81 applications had been received for the post of Superintendent. The following three were asked to appear before the Trustees:—Capt. Robert Roberts, Portmadoc; Capt. T. H. Rothwell, Moelfre; and Capt. T. Rees Thomas, Llys Helen, Caernarvon. The result of the voting was as follows:—Capt. T. Rees Thomas, 21; Capt. Rothwell, 14.

Progress at the Port of Dublin in 1935

AT the meeting of the Dublin Port and Docks Board held on 9th January, the Lord Mayor (Alderman A. Byrne, T.D.), presided until the election of chairman for 1936.

On the motion of Major Hollwey, seconded by Mr. J. J. Halpin, Mr. C. M. O'Kelly was unanimously elected Chairman, and was duly invested with his badge of office by the Lord Mayor.

Returning thanks, the new Chairman said he was grateful for the honour, and would, with the Board's assistance, do all he could in the interests of the port.

Captain Alan S. Gordon was elected Vice-Chairman on the motion of Mr. T. R. McCullagh, seconded by Mr. J. M. Irwin.

Capt. Gordon, replying, described the Port of Dublin as one of the most important links with the outside world. This year there were possibilities of great development, of which they should take full advantage. He looked forward to a year of increased prosperity.

Moving a vote of thanks to the outgoing Chairman, Mr. T. F. Laurie, for his services during the past two years, Mr. Kennedy said that he had carried out his duties in a most satisfactory manner. He took particular care to be fully acquainted with every matter on the agenda, and in that way greatly helped the Board. The Board had never been better served as chairman than by Mr. Laurie.

Mr. P. J. Munden seconded. During Mr. Laurie's chairmanship, he said, the Board had embarked upon developments on the right lines, and the greatest tribute that could be paid to him was the marvellous reception given to the recent loan. It showed that the Board had the confidence of the public.

New Tonnage Record.

Mr. T. F. Laurie, in the course of his reply, thanked every member of the Board for their unfailing kindness and co-operation during his period of office as chairman. In May of last year, the Board sustained a heavy loss in the death of Mr. Wm. Hewat, who, during his thirty-one years' continuous membership, gave ungrudgingly of his time, energy and constructive thought. While in 1934 there was an increase in the tonnage of vessels from foreign ports and a decrease in the tonnage from cross-Channel and coastwise ports, there was at the time a record tonnage entering the Port of Dublin, amounting to 2,559,967 tons. It was a matter of congratulation that the year 1935 showed an increase of 8,607 tons over and above the 1934 figure.

Tonnage Increases.

In 1935, said Mr. Laurie, a fresh tonnage record had been set up in the amount of 2,568,574 tons. This figure did not include the tonnage of two liners (20,032 tons), which anchored in the bay and did not come up to the Board's quays.

Continuing, Mr. Laurie said:—

"The relative position of the foreign and coastwise shipping is, however, reversed. This year the tonnage from foreign ports shows a marked decrease, while the tonnage from cross-Channel and coastwise ports shows a large increase. The relative position is as follows:—

		Tonnage Figures		
		1934		1935
Foreign Ports	Inc.	162,265	Dec.	266,531
Cross-Channel and Coastwise ...	Dec.	25,035	Inc.	275,138
	Net Inc.	137,230	Net Inc.	8,607

"The comparative figures for the two years showing the number of vessels and the tonnage in each of the two classes is as follows:—

	1934		1935	
	No. of Vessels	Tonnage	No. of Vessels	Tonnage
Foreign	904	1,096,832	663	830,301
Coastwise, etc., Omitting Trawlers	3,944	1,463,135	4,851	1,738,273
	4,848	2,559,967	5,514	2,568,574

More Vessels.

"These figures demonstrate that there was a physical increase in the number of vessels entering the port during 1935, to the extent of 666. It follows, therefore, that while the number of vessels entering the port has largely increased, the increase in the total tonnage figures is only 8,607 tons. This is readily explained by the reduction in 1935 in the number of vessels of large tonnage—principally with coal—which arrived from foreign ports, as compared with 1934. This reduction is little more than offset by the tonnage of the increased number of smaller vessels arriving from cross-Channel and coastwise ports.

"In spite of this change in the incidence of shipping entering the port during 1935 the record tonnage figure of 1934 is not only maintained but has been increased, and a new high-water tonnage mark has been reached.

"In respect of the receipts under the head of tonnage dues on vessels we show a reduced revenue in the amount of £3,434, which is due to the fact that the tonnage dues on foreign vessels are relatively higher than the tonnage dues on cross-Channel and coastwise vessels. There is, however, an increase in dues on goods to the extent of £1,725.

"The gross receipts of the port in the year 1935 were £204,000, and of the Custom House Docks and Warehouses £39,700, a total of £243,700, being a decrease on 1934 of £2,600.

"At this early stage it is not possible for me to give you physical details of our expenditure, but the result of our operations for the year 1935 shows a surplus of revenue over expenditure in the neighbourhood of £5,500, which in all the circumstances must be considered as highly satisfactory.

Big Developments.

"During the year 1935 the Board has authorised large expenditure for development purposes. New works of a capital nature only are responsible for over £100,000. Some of the principal works completed and or put in hand are as follows: New tobacco warehouse, Custom House Docks; new cattle lairage, Custom House Docks; nine new warehouse cranes, two new 4-ton electric cranes, South quays, and extension of crane rails for same; new steam hopper barge, two and a quarter million tons of material dredged from the river and bar; lighthouses in port altered according to international system, completion of North quay extension, improvements at Alexandra quay, including new tramway siding; additional land provided for letting at reclaimed lands and a new branch road constructed, 300 feet of boundary wall constructed at East Wall road reclamation, new slipway at Ringsend for ferry service, reconstruction of port stores and allocated sheds after two fires.

"In connection with the new tobacco warehouse, it is, perhaps, fitting to point out that this is the largest in Ireland, and is probably larger and better equipped than any tobacco warehouse even in Great Britain.

"The new cattle lairage represents the very latest idea in that class of structure, and its erection was carried out in co-ordination with the Department of Agriculture.

"The new 4-ton electric cranes on the South quays are of the most modern type of level luffing cranes, designed for high-speed working.

"The new steam hopper barge is being built to Lloyd's special requirements, and will be a considerable acquisition to the Board's dredging fleet, and it is also contemplated to increase the dredging fleet by the addition of a further grab dredger.

"The dredging fleet has worked with exceptional success during the year under review, and has removed 2½ million tons of material from the river and bar, an output which has not previously been achieved in the history of the Port of Dublin.

"The alteration of the lighthouses to the international system indicates that even in these matters the Port of Dublin is in the forefront of port matters.

"The completion of the North quay extension, which will take place early in the present year, will place at the disposal of the port another 800 feet of added berthage, and provide much-needed accommodation for timber and other bulky cargoes.

"Arising out of the improvements at Alexandra quay, you will recollect that the tramway which the Board has provided was put down to facilitate the handling of Irish-grown wheat.

"Sites for factories are available on the reclaimed lands at the east end of Alexandra road, and also on the new ground being formed alongside the East Wall road. Two lettings have already been arranged on these particular reclaimed sites, and further applications for sites are at present under consideration."

S.S. "Skylight."

Messrs. Ferguson Brothers (Port Glasgow), Ltd., launched from their yard, on January 14th, the single-screw coaster, "Skylight," built to the order of Messrs. Ross and Marshall, Limited, Greenock.

She is fitted with compound surface condensing engines.

The vessel was named "Skylight," the christening ceremony being performed by Miss Jean Campbell, daughter of Colonel Hugh Campbell, Managing Director, Messrs. Ross and Marshall, Ltd.

Port of Southampton Topics

Docks Statistics for December.

The December statistics for Southampton Docks proved a fitting termination to a year of increased activity. The number of vessels inward increased from 186 to 213, and outward from 188 to 214.

The tonnage returns were impressive. Inward gross tonnage jumped from 884,845 tons in December, 1934, to 1,153,032 tons, an increase of 268,187 tons, while the outward figure was 1,145,884 tons, as compared with 955,284 tons, an advance of 190,600 tons.

The net figures were equally satisfactory, there being an inward increase of 159,720 tons and outward of 113,243 tons. The returns inward were 650,081 tons, as against 490,361 tons; outward 649,254 tons, as compared with 536,011 tons.

The volume of cargo handled in December was 26,610 tons more than in the corresponding month of 1934. Imports totalled 55,685 tons, compared with 41,246 tons, and exports 36,928 tons, compared with 24,757 tons. This gave an increase of 14,439 tons in inward cargo and 12,171 in outward freight.

The passenger figures were: inward 8,983, as against 6,873; outward 11,862, compared with 9,177. The increases were therefore 2,110 inward and 2,685 outward.

New Service calling at Southampton.

During the past month Southampton welcomed a new service to the port. On January 13th the Baltimore Mail Steamship Company officially inaugurated their fortnightly service from Southampton, the first call being made by the "City of Norfolk" (8,424 tons).

The Baltimore Mail Steamship Company maintains a weekly service across the North Atlantic, but only once every two weeks do their vessels establish contact with the United Kingdom. East-bound the vessels having a British call sail from Baltimore and Norfolk to London before concluding their passage at Hamburg. West-bound they call at Havre and Southampton.

The other vessels with no United Kingdom port of call sail from Baltimore and Norfolk for Havre and Bremen, and then return with Havre as their only intermediate port on this side of the Atlantic.

The principal effect of the visits of the Company's ships to Southampton will be to increase the volume of freight dealt with at the port, for previously, when the ships called at London east-bound to discharge cargo, they also loaded freight for their west-bound voyage.

Port of London Authority

At a Special Meeting of the Port of London Authority held on January 23rd, the following Resolution was passed:—

> That the Members of the Port of London Authority in Special Meeting assembled record their profound sense of the great loss that the Empire has sustained by the death of their Sovereign King George V. and their high appreciation of his unfailing and unselfish devotion throughout his reign to the interests of the Empire and the welfare of his people.
>
> That they offer to His Majesty King Edward VIII. and to Her Majesty Queen Mary and the other Members of the Royal Family their heartfelt sympathy in the bereavement they have suffered.

The Authority also passed the following Resolution:—

> That the Members of the Port of London Authority in Special Meeting assembled humbly offer to His Majesty King Edward VIII. their respectful congratulations on His Majesty's accession to the Throne and an assurance of their loyalty and devotion.

London's Shipping.

During the week ended 27th December, 779 vessels, representing 830,482 net register tons, used the Port of London. Of these, 355 vessels (651,673 net register tons) were to and from Empire and Foreign Ports and 424 vessels (178,809 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 3rd January, 859 vessels, representing 937,416 net register tons, used the Port of London. Of these, 431 vessels (726,073 net register tons) were to and from Empire and Foreign Ports, and 428 vessels (211,343 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 10th January, 1,160 vessels, representing 1,092,894 net register tons, used the Port of London. Of these, 465 vessels (883,017 net register tons) were to and from Empire and Foreign Ports, and 695 vessels (209,877 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 17th January, 879 vessels, representing 919,316 net register tons, used the Port of London. Of these, 427 vessels (696,638 net register tons) were to and from Empire and Foreign Ports, and 452 vessels (222,678 net register tons) were engaged in coastwise traffic.

Tilbury Passenger Landing Stage.

Thirty-seven vessels, totalling 395,907 gross register tons, used the Passenger Landing Stage during the month of December.

Shipping Figures for 1935: London Record.

Ships to and from British Ports during the year 1935 aggregated 349,577,851 net registered tons—an increase of 1.1. per cent. on 1934.

The figures for the Port of London at 59,752,434 net registered tons are the highest ever recorded, and constitute a record for British ports. The figures for other chief ports are as follows:—

Liverpool, 33,228,099 net registered tons; Southampton, 25,004,035 net registered tons; Hull, 12,115,428 net registered tons; Manchester, 7,573,204 net registered tons; Bristol, 7,091,650 net registered tons.

Otago Harbour, New Zealand

OTAGO HARBOUR, comprising both Dunedin (Upper Harbour) and Port Chalmers (Lower Harbour) is situated on the south-east coast of the South Island of New Zealand, latitude 45° 47'S., and longitude 170° 45'E., and comprises a narrow inlet of water with a navigable channel of a least water depth of 30 ft. and a least width of 350 ft. for six miles to Port Chalmers, and a dredged channel—Victoria Charnel—of a navigable low-water depth of 20 ft. 6 in., and a width ranging from 150 ft. to 800 ft. for a further seven miles to Dunedin.

The entrance to the harbour is between Taiaroa Head and the extremity of the North Mole, north-westward of the Head.

Within the entrance, a spacious sheet of water extends south-westward for 13 miles, and at its head stands the City of Dunedin, the chief City of the province of Otago, with a population, including suburbs, of 86,500.

Immediately north-westward of Halfway Island is the town of Port Chalmers at the head of Koputai Bay, with a population of 2,600. Port Chalmers is connected with Dunedin by the main railway system.

Whether a vessel will be berthed at Dunedin or Port Chalmers is practically decided by the draught of the vessel, and at the present time vessels drawing over 23 ft. have to discharge or load at Port Chalmers. In order to enable vessels drawing up to 25 ft. to berth at Dunedin, the Board has set down a dredging policy to obtain a depth of 22 ft. at low water in the Victoria Channel.

With this object in view, a definite dredging programme has been carried out for some time—for economic reasons restricted somewhat during the depth of the depression—and it is anticipated that the objective will be reached in a very short time, which will mean that vessels drawing up to 25 ft. will be able to berth at Dunedin Wharves.

To-day, as a result of the enterprising and progressive policy of the Otago Harbour Board, constituted in 1874 to assume control of the harbour, vessels up to 33 ft. draught can berth at Port Chalmers and up to 23 ft. at Dunedin.

Dredging and harbour improvements have been progressing continuously, and to-day the harbour is one of the four main and modern ports of the Dominion.

The majority of oversea vessels visiting the port berth at Dunedin, which has about 6,000 ft. of wharfage accommodation with ample up-to-date equipment for cargo; commodious reinforced concrete sheds have been provided; the wharves and sheds have electric light; Birch Street Wharf is connected with the main railway system, while the connection of Victoria Wharf, the main overseas berth, is now nearing completion.

Ample berthage is available for deep-sea livers and coastal craft at Port Chalmers. The wharfage accommodation is about 5,100 ft. in length and is served by the main railway system connecting at Dunedin; there are two dry docks at Port Chalmers, both owned by the Board; the Board is the possessor of the powerful tug and salvage steamer "Dunedin," which has some notable salvage achievements to its credit.

The Board has vested in it practically the whole of the harbour foreshore, and considerable reclamation work has been carried out in conjunction with the deepening of the harbour. An area of 100 acres of city lands, comprising portion of the business and manufacturing area of the city, is now leased, while a similar area is either reclaimed and available for lease or nearing completion of reclamation.

The following figures are most interesting and will give a good idea of the growth of the port since the constitution of the Board in 1874.

The following shows the cargo handled at the port in decades (complete figures are not available for the first decade):—

	Inwards	Outwards	Total
1884—1893	1,232,100	680,300	1,912,400
1894—1903	1,652,100	764,800	2,416,900
1904—1913	2,605,300	1,236,400	3,841,700
1914—1923	2,626,400	1,395,800	4,022,200
1924—1933 (to Sept. 30th)	2,675,100	1,229,300	3,904,400

A similar comparison of the net registered tonnage of the vessels arriving at the port is as follows:—

1874—1883	2,657,500
1884—1893	3,749,600
1894—1903	5,588,100
1904—1913	9,791,700
1914—1923	7,034,800
1924—1933 (to Sept. 30th) ...	9,911,300

An interesting comparison is one showing the receipts for the various decades:—

	£
1874—1883	218,400
1884—1893	471,000
1894—1903	679,000
1904—1913	922,500
1914—1923	1,088,300
1924—1933 (to 30th Sept.) ...	1,609,000 (x)

(x) Includes receipts from Docks from October, 1926.

During the year ended September 30th, 1935, 585 vessels of 1,044,327 tons net visited the Port of Otago, and the allocation thereof was as follows:—

	Vessels	Tons Net
Dunedin	502	680,632
Port Chalmers	83	368,695

For the same period, the amount of cargo handled at the Port of Otago was imports 209,591 tons, and exports 115,940 tons, and the allocation thereof was as follows:—

	Imports Tons	Exports Tons
Dunedin...	232,369	71,686
Port Chalmers	37,222	44,254

The chief imports and exports of the port are as follows:—

Imports:—Coal, Timber, Petroleum Products, Fertilisers, manufactured and raw materials and general merchandise.

Exports:—Butter, Cheese, Wool, Frozen Meat, Gold, Hemp, Grain, Hides, Skins, Tallow and Apples.

Future Development.

With the object of improving the entrance to the Port of Otago and with the further object of improving the channel depths and to provide further facilities for the handling of cargo to meet the requirements of the class of vessels visiting the Dominion, the Board, some few years ago, embarked upon a comprehensive harbour improvement scheme involving an expenditure of £350,000.

The principal works of this scheme were as follows:—

1. The acquisition of a powerful and up-to-date dredge. (This vessel was built by Messrs. Fleming and Ferguson, Ltd., at Paisley, Scotland, and since her arrival has carried out exceptionally fine performances in maintenance and developmental dredging).
2. The reinstatement of the Mole at the entrance to the port. (This is considered as one of the most important works undertaken by the Board, and it was embarked upon with the object of improving the entrance to the port and channel depths. The work has proceeded with expedition since its inception, and close observations indicate that the desired effect is being achieved. The superstructure of 4,100 ft. approximately has been completed, and the stone work to high-water mark has been completed to within 200 ft. of the same distance).
3. Railway connection and extension of Victoria Wharf, Dunedin (the main overseas berth). (The extension and reconstruction works have been completed, and the necessary cross-overs for railway sidings have been laid. The linking up with the main railway system is at present being undertaken, and is expected to be completed at an early date).
4. New cargo shed and cargo-handling appliances at Dunedin. (A new concrete cargo shed, 320 ft. by 30 ft., has been erected at Rattray Street, and two 3-ton electric luffing cranes installed at Victoria Wharf).

With the object of improving the facilities and providing another overseas berth at Port Chalmers Wharves, the Board has recently authorised the carrying out of certain improvements to these wharves at a cost of £14,000. The work is to be put in hand forthwith and financed from revenue and reserves.

Other improvements are contemplated when this work is completed.

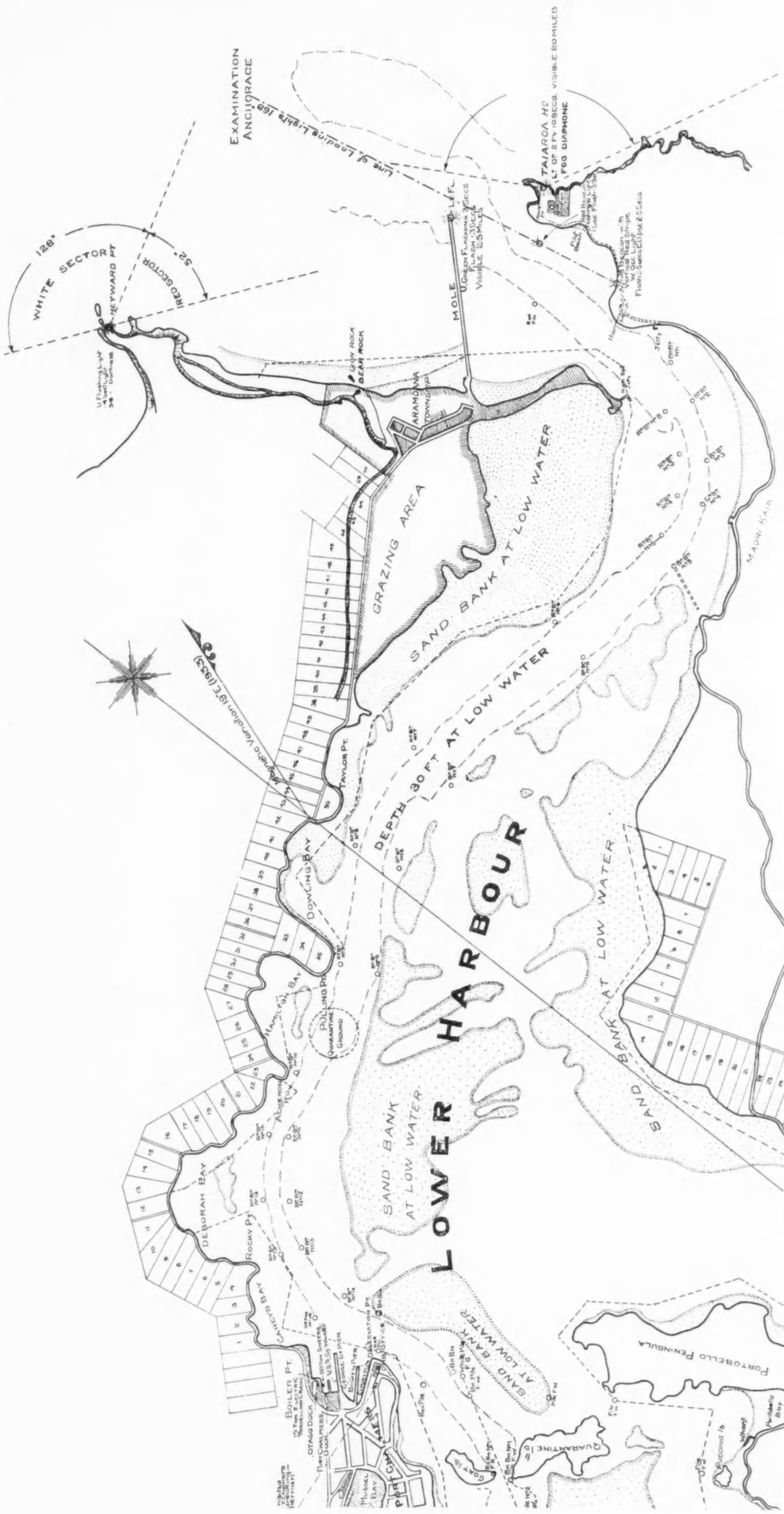
Reclamation Works.

In order to provide for the economical disposal of spoil from the dredges, an area of some 180 acres at Dunedin was, some years ago, enclosed by a retaining wall, and recently the reclamation of a 25-acre paddock was commenced and is proceeding expeditiously. The Board proposes to reserve this area as a site for an airport, and being situated right in the heart of the city, is regarded as an ideal location.

In consequence of the dredge being shifted to the Lower Harbour to improve the channel to Port Chalmers, the reclamation of 23 acres at Mussel Bay, Port Chalmers, was commenced, and when completed will form a valuable addition to the Board's lands in that locality.

It may be of interest to record that to date some 700 acres of tidal lands have been reclaimed from the harbour, and this land, comprising a portion of the commercial centre of the City of Dunedin, has added materially to the Board's revenue.

Otago Harbour, New Zealand



DOCKING FACILITIES AT PORT CHALMERS

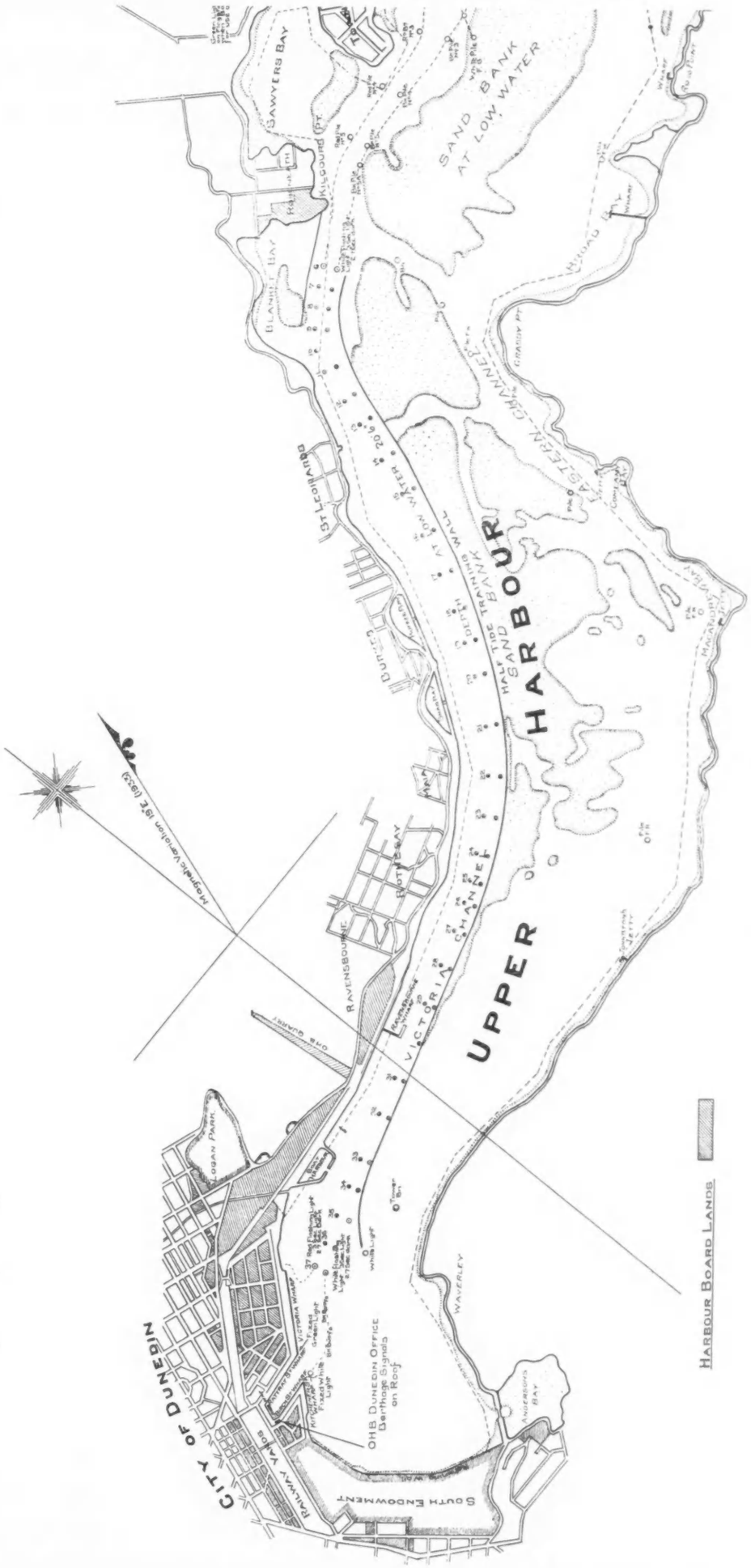
	Otago Dock ft.	Pt. Chalmers Dock ft.
Length on Floor	500	800
Width on Floor	56	41
Width, Top of Keel Blocks ...	67	43

	Otago Dock ft.	Pt. Chalmers Dock ft.
Width, Top of Dock	90	68
Width at Dock Gates	70	50
Depth on Keel Blocks, H.W.O.S.T.	21	18

Vessels to 530 ft. can dock in Otago Dock depending on Type of Stern. Vessels to 335 ft. can dock in Port Chalmers Dock.

The Lower Harbour and Wharves at Port Chalmers.

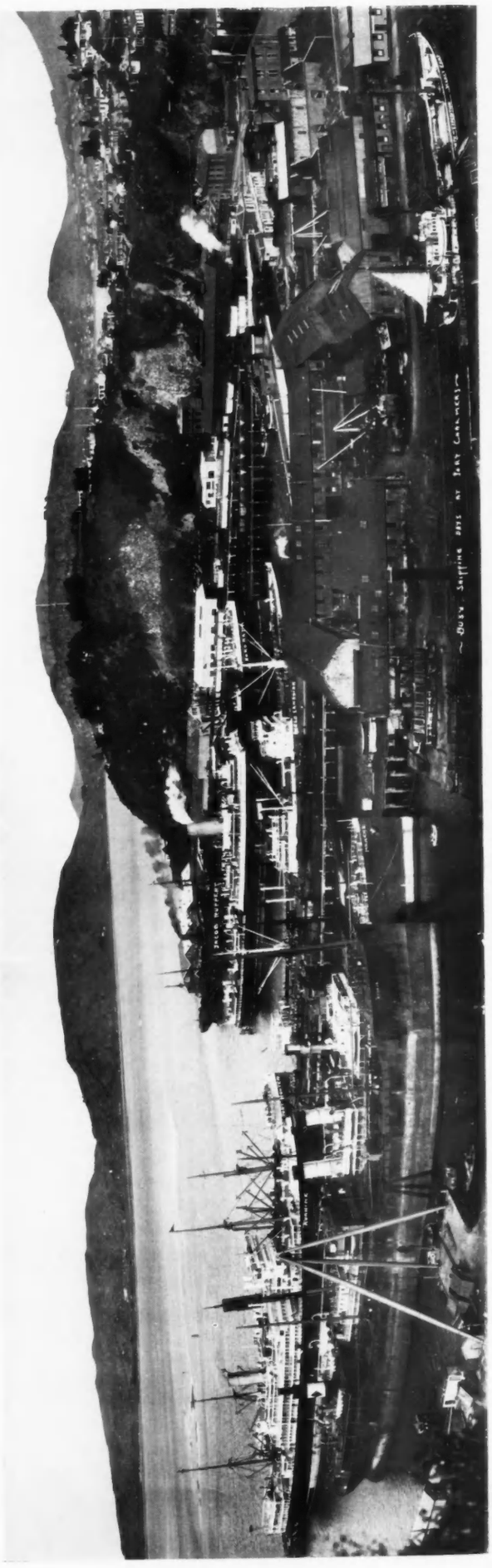
Otago Harbour, New Zealand



The Upper Harbour and Wharves at Dunedin.

Otago Harbour, New Zealand

View of the Port of Dunedin.



Busy Shipping Days at Port Chalmers.

Hull and the East Coast

Humber Bridge Project.

THE preliminaries in connection with the revived project of a road-bridge across the River Humber, between Hull and North Lincolnshire, have so far progressed that the scheme is now under consideration by the Ministry of Transport with a view to its eligibility for a Government grant. Plans have been drawn up by Mr. Ralph Freeman, of Sir Douglas Fox and Partners, and it is stated that the estimated cost is £2,600,000, or £850,000 more than the scheme of 1930, from which the promise of Government aid was withdrawn on the grounds of national economy. The Hull Corporation, who are the sponsors of the project, are hopeful of obtaining a grant of possibly 75 per cent. of the estimated cost, the balance to be contributed by the Municipal and County Authorities on either bank of the Humber. It is conjectured that the traffic over the proposed bridge would contribute sufficient money in tolls to enable the undertaking to pay its way. As already reported, the new bridge is to have a single central span of approximately 4,500 feet with a headway of 105 feet, and will be the longest of its type in the world. The elimination of stone piers included in the earlier scheme is intended to remove all cause of possible danger to shipping and the navigable channel of the river, upon which certain local and river authorities feel very strongly. Trial borings for the approaches have been made on both banks of the Humber on the probable sites of the approaches. The details of the scheme have not yet reached the stage when publication is possible, but it is understood that they will be prepared and submitted to the Hull Corporation and the Humber Conservancy Commissioners at the earliest possible date.

Rail Traffic at the Port of Hull.

To further facilitate the handling of rail traffic at the Port of Hull, the London and North-Eastern Railway have just brought into use a new and most up-to-date goods yard for the marshalling of wagons arriving at Hull. The length of the new yard is two miles, 9 chains, while the extent of the permanent way laid down is 24¾ miles, of which five miles is point-crossing work. Standage is provided for 2,700 wagons in two main groups of six reception sidings and thirty marshalling sidings, and it will be possible to "turn-over" 2,500 wagons every 24 hours. The "yard" is constructed on the "hump" principle, and has been provided with special retarders and hydraulic brakes operating on the wheels of moving wagons so as to check their momentum and bring them carefully to rest in the respective marshalling sidings. The control of these retarders and also the points and crossings is from a tower, three sides of which are fitted with glass walls so that the controllers have an uninterrupted view of the whole yard. This control tower, of modern design, is carried on fifteen reinforced concrete piles of 20 ft. The control desk in the tower is furnished with a diagram of the area controlled, and is operated by the controller by means of electro-pneumatic buttons. At night the whole of the sidings are floodlit. Separate departure lines are provided for locomotives in order that their movements shall not interfere with the working of the yard. The construction of the yard, it is interesting to learn, has involved the dumping of 7¼ million cubic feet of filling material, all of which has been obtained from a quarry excavated in the side of a railway cutting 60 ft. deep at Kirkella. In preparing the site the Fleet Drain was diverted for a distance of 230 yds., entailing 130,000 ft. of excavation. Other improvements carried out by the London and North-Eastern Railway at Hull recently, have been the installation of new coal-shipping appliances, the adaptation of hoists for dealing with 20-ton wagons, and improved signalling for the steam fishing trawlers at St. Andrew's Dock.

Shipping at Hull Docks in 1935.

The shipping entering the docks at Hull and paying dues in 1935 amounted to 6,999,148 net registered tons, an increase of 440,408 tons, equal to 6.7 per cent. upon the previous year. This total has been exceeded only twice in the history of the part, viz., in 1924 and 1930, when in each year the seven-million line was passed. The imports of wheat and kindred cereals and timber were slightly less than in 1934, but there were increased arrivals of oilseeds, nuts and kernels, fruit, sheep's wool, petroleum and vegetable oils, which more than compensated for the loss in other directions. Generally, the overseas commerce of the port was thus rather better than in the preceding twelve months, though the coal export trade remained stationary. There are divided opinions as to the benefit received from the tariff policy of the Government, but, if there is any, it would appear to be only slight. Exports of manufactured articles have been somewhat larger, but the unsettled economic and political condition of affairs, particularly in central Europe, has been a serious handicap on efforts to improve trade. The Hull fishing industry, however, has gone from success to success, the landings of fish by British-owned trawlers in 1935 being around 5½ million cwts, the highest total in the history of Hull. The fleet now consists of nearly 350 steam trawlers, for the better accommodation of which dock extension of five acres of water space is projected at a cost of £750,000 at the St. Andrew's Dock.

Coal Exports at the Humber Ports.

The exports of coal shipped at the Humber ports (Hull, Grimsby, Immingham and Goole) to the order of buyers abroad in 1935 amounted to 3,234,938 tons, as compared with 3,281,131 tons in 1934, a decline of rather more than 46,000 tons. The shipment of coal in the bunkers of foreign-going vessels are around 2,800,000 tons and shipments, London and coastwise, in the region of 1,250,000 tons—in all, between 7¼ and 7½ million tons. It is noteworthy that the exports (foreign) from the Humber have stood at about 3¼ million tons annually for four years past, comparing with 6½ million tons in 1929, and something over 6 million tons in 1930. A contraction of approximately half is obviously a serious matter for the ports which have electric coal conveyors, and other modern shipping appliances capable of handling in normal circumstances 15 million tons and more in the course of a year. The operation of the Coal Mines Act, 1930, is largely blamed for this unfortunate state of affairs, and renewed efforts are being made at Hull and elsewhere to secure some amendment so that all coal for shipment shall be freed from quantative control and price restrictions, which are at present the great handicaps on the development of foreign trade.

Timber Imports at Hull.

The fact that the imports of timber (hewn and sawn) at Hull in 1935 again far exceeded a million loads, gives added emphasis to the demands of the shipping community that additional dock space and discharging berths shall be provided at the Victoria Dock. A million loads is now the normal annual import, and it is a fact that whereas in a certain period the quantity has doubled, the dock accommodation has not been correspondingly extended. Make-shift arrangements have included the sending of incoming vessels to other docks to discharge, but this has been proved to be altogether unsatisfactory and has done but little to relieve the congestion at Victoria Dock which, in varying intensity, persists season after season.

Safe-Working Loads.

The Marine Department of New Zealand have recently issued a new edition of their book on "Safe-working Loads" and which is published at 1s. The book, which comprises 80 pages, describes very fully safe-working loads for chains and ropes, and supersedes the edition published in 1927.

Priestman Bros., Ltd.

Messrs. Priestman Bros., Ltd., Holderness Foundry, Hull, have recently issued a very-well produced booklet, No. 545, which describes and illustrates the "Cub" ¼ cu. yd. excavator, which is the lightest excavator of its size and type in the world.

The booklet comprises 16 pages, and describes very fully the many uses to which the "Cub" excavator can be applied. The illustrations also describe very vividly the working range of the "Cub" excavator.

If any of our readers wish to obtain a copy of this booklet they can do so by applying to Messrs. Priestman Bros., Ltd., and mentioning this journal.

Isle of Man Harbours: Passenger Returns.

Season (1st May to 30th Sept.)	1934	1935
Douglas	529,747	532,138
Ramsey	3,517	3,903½
Peel	648	658
	533,912	536,699½

No. of passengers embarked and disembarked at Port of Douglas during year ended 30th September, 1934, 1,156,880½; and 1935—1,161,843.

Greatest number of arrivals at Douglas in any one day: 3rd August 1935—37,830½.

Greatest number of departures from Douglas in any one day: 10th August, 1935—31,966.

Greatest number of arrivals and departures at Douglas in any one day: 10th August, 1935—60,447½.

Buyers' Guide for Dock and Harbour Authorities

For Particulars of Space in this Guide apply to the Manager, "The Dock and Harbour Authority," 19, Harcourt Street, Marylebone, London, W.1.

AUTOMATIC WEIGHERS.

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